Delivering Health Services in a Rural Ethiopian Hospital

Employing practice theory to understand the role of health system bureaucracy, electricity, electric equipment and electric light

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ABSTRACT

As the global health community seeks to, "ensure healthy lives and promote wellbeing for all", as outlined in the Sustainable Development Agenda, unreliable electricity in health facilities is one challenge that needs attention. However, in a public health field dominated by quantitative research methods, a comprehensive understanding of how health workers and their daily tasks are affected by this condition is lacking. Using qualitative methods, including interviews and participant observation, this study seeks to remedy this information-gap by first answering: *How does the health system bureaucracy and the availability of electricity, electric equipment and electric light influence the way workers at a rural Ethiopian hospital perform their jobs and deliver health services?* Practice theory is then used to expand this analysis and consider: *How are the health care practices of hospital workers, particularly electricity-dependent ones, shaped by social norms and cultural values, the material resources at workers' disposal, as well as workers' knowledge, skills and motivation levels?*

The findings show that a number of routine health care practices were imbedded in the daily work life of hospital staff and were performed more or less habitually. These routines continued in spite of resource gaps, while others had developed as a response to gaps that staff had come to anticipate. However, the unpredictability of the situation hospital staff worked in and the unreliable availability of certain highly consequential resources meant that other routines were constantly changing or that in certain situations routines could not be formed at all. To understand these findings the study considers how hospital workers' past experiences and consequent knowledge have shaped their workplace actions. The analysis shows that a strong cultural preference in Ethiopia for urban settings resulted in poor recruitment and retention of staff at the hospital, meaning skills levels were generally low. The study also reflects on the apathy among staff resulting from unreliable availability of electricity, electric equipment and other essential resources, as well as staffs' general dislike of generators due to the heavier work burden they created. The study demonstrates that the inclusion of qualitative research methods will be essential as the global health community seeks to understand the realities health workers in LMICs face and identify ways for them to find job satisfaction and deliver quality health services.

FOREWORD

All the support and guidance I have received while writing this thesis have been immensely beneficial and greatly appreciated. This cannot go unrecognized.

First and foremost, I would like to thank the staff at the hospital in southwestern Ethiopia where I conducted my research for the warm reception and active cooperation. Your openness gave me frank and unique insight and your unwavering patience allowed me time to gradually understand. Both were instrumental to the completion of this study. I would also like to thank the Oromia Regional Health Bureau for granting me permission to conduct my research and the hospital leadership for facilitating my stay.

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ACRONYMS

CEO – chief executive officer

DIFID – United Kingdom's Department for International Development

ETB – Ethiopian birr (currency)

GP – general practitioner (physician)

ICU – intensive care unit

LMIC – low- and middle-income country

MC – management committee

MD – medical director

MDG – Millennium Development Goal

MW – megawatts

NGO – nongovernmental organization

NICU – neonatal intensive care unit

Ob/Gyn – obstetrics and gynecology/ obstetrician and gynecologist

OPD – outpatient department

OR – operating room

ORHB – Oromia Regional Health Bureau

SDG – Sustainable Development Goal

VSO – Voluntary Services Overseas

WHO – World Health Organization

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1. INTRODUCTION

Building and maintaining strong health systems is an essential part of the response to the world's myriad of global health challenges. The Ebola outbreak in West Africa from 2013 to 2016 provided a stark reminder of the detrimental consequences weak health systems can have, not only for local communities but the world at large. Health systems in Guinea, Liberia, and Sierra Leone crumbled under the epidemic's pressure, in large part due to inadequate investments. The result: a lengthy, uncontrolled spread of the disease across multiple borders. In addition to addressing global health emergencies, strong health systems are needed to tackle persistent global health problems such as communicable diseases and maternal deaths as well as immerging global health challenges including cancer and diabetes.

Though several components are needed to build robust health systems, basic infrastructure, (including buildings, water and electricity), availability of skilled human resources, and reliable access to pharmaceuticals and medical supplies are essential. Unfortunately, several low- and middle-income countries (LMIC) struggle to ensure just an adequate supply of these basic elements. Financial constraints are usually to blame but, in some cases, other factors are also at fault like low priority setting and corruption.

For those working within weak health systems, conditions can be tough. This is evident by the low morale documented among health workers throughout LMICs and the major challenge several countries face trying to retain these workers in their jobs (Narasimhan et al. 2004). While numerous research efforts have sought to pinpoint the exact challenges and reasons for workplace dissatisfaction among these health workers (Dussault and Franceschini 2006, Rowe et al. 2005, Willis-Shattuck et al. 2008), less research has sought to comprehensively understand the everyday realities of work life at resource-constrained health facilities. Public health and medical research are often dominated by numbers and statistics, and few have sought to create a comprehensive, qualitative picture of how workplace conditions hinder (or support) health workers in their efforts to deliver health services. A heavy reliance on quantitative methods, such as the use of surveys or standardized interviews with

predetermined answer choices, has arguably led to a limited picture of the daily realities faced by health workers in LMICs as well as a narrow understanding of how we can improve their working conditions. By supplementing pervious research with qualitative looks at workers' day-to-day experiences in the workplace, a more complex picture might emerge and provide useful insights into how the conditions of health workers can be enhanced and health care processes be improved.

As mentioned, there are a number of factors in health facilities that impact staffs' ability to do their jobs and find workplace satisfaction, but access to basic, essential infrastructure seems to be a fundamental one. For example, health facilities to house patients and water for cleaning and sterilization purposes are important. Access to electricity that can ensure lighting and power diagnostic and life-saving medical equipment seems equally essential. But basics such as these are not guaranteed throughout health facilities in LMICs. A study from 2013 that reviewed energy access in health facilities throughout sub-Saharan Africa found that among the 11 countries with data available, an average of 26 percent of health facilities did not have any access to electricity and only 34 percent of hospitals were found to have 'reliable' electricity ('reliable' being defined as no outages of more than two hours in the past week) (Adair-Rohani et al. 2013). While evidence exists to indicate there are clear electricity problems in LMIC health sectors, limited research has been conducted to understand how health workers experience electricity constraints on the job and how they maneuver through this obstacle. What types of actions do they take to mitigate the impact and ensure the continuation of life-saving care?

1.1 Research questions

The current study attempts to contribute to a more comprehensive understanding of the workplace realities health workers practicing in resource-restricted settings face, and particularly considers the role electricity (or a lack thereof) plays in health workers' daily actions. To gain this comprehensive perspective the study considers a number of factors, including the health system bureaucracy's role in managing and ensuring the supply of needed resources, such as electricity and electric equipment, in health facilities. It also considers how electricity, electric medical equipment and

lights are utilized in such a setting. Using the case of a rural hospital in southwestern Ethiopia I first seek to answer the question: *How does the health system bureaucracy and the availability of electricity, electric equipment and electric light influence the way workers at a rural Ethiopian hospital perform their jobs and deliver health services?* Using a practice theory lens, I then proceed to explore: *How are the health care practices of hospital workers, particularly electricity-dependent ones, shaped by social norms and cultural values, the material resources at workers' disposal, as well as workers' knowledge, skills and motivation levels?* To identify variations in the experiences of different staff, the study also reflects on the role gender, seniority and formal titles play in health workers' actions and room to act.

1.2 Outline of thesis

I begin my thesis by explaining the rationale for the study. This chapter includes information on remaining global health challenges, the role improved electric infrastructure can play in improving global health outcomes, and a look at electricity as a potential factor impacting satisfaction levels among health workers, and particularly women health workers, in LMICs. In Chapter 3 I proceed to explain the research methodology I followed, including why I selected a rural Ethiopian hospital as my research case and why I utilized a qualitative research approach. I also present the research methods I used (interviews and participant observation) as well as the potential biases I had to reflect on and try to avoid throughout my research. In Chapter 4 I present the theoretical framework on which I base my final analysis – practice theory. I explain the elements that distinguish this theory and present two related concepts – technology script and Pierre Bourdieu's forms of capital – which also feature in my analysis. In Chapter 5 I begin to present my findings, particularly those related to Ethiopia's health system bureaucracy as well as the management structures and decision-making hierarchy at the hospital. In Chapter 6 I continue presenting my findings, this time those related to electricity availability at the hospital and how this electricity was used. Actions related to backup electricity sources, electric medical equipment, lighting and telecommunications are all included. It is through findings in Chapter 5 and 6 that I answer my first research

question regarding how the health system bureaucracy and the availability of electricity, electric equipment and electric lights influenced the way workers at the hospital performed their jobs and delivered health services. In Chapter 7 I analyze the findings using a practice theory lens and seek to understand health care practices at the hospital in light of three elements central to this theory: social norms and cultural values, material resources and personal attributes. Here I answer my second research question related to how the health care practices of hospital workers are shaped by social norms and cultural values, the material resources at workers' disposal, as well as workers' knowledge, skills and motivation levels. Chapter 8 includes final reflections on the important contributions of this study and suggestions for how to improve research on the experiences of health workers and the role of electricity in the health sector moving forward.

2. BACKGROUND

In this chapter I establish the rationale for my study by exploring existing literature on the relationship between electricity, health care delivery and health outcomes. I begin by pointing to persistent health challenges on the global development agenda before considering the role improved infrastructure, particularly in the form of better electricity access, might play in addressing these gaps. I then conclude the chapter by considering how health workers, and particularly female health workers, are impacted by electricity access in their work.

2.1 The global health agenda

While more people globally are living healthier and longer lives today compared to years before, inadequate access to essential health care and poor health outcomes remain persistent problems particularly in LMIC. While the progress made on global health indicators during the Millennium Development Goals (MDG) decade were laudable, particularly in certain countries and regions, gaps have persisted. In the final Millennium Development Goal (MDG) Report for 2015 it was noted that (United Nations 2016, 8-9):

> "About 16,000 children die each day before celebrating their fifth birthday, mostly from preventable causes. The maternal mortality ratio in the developing regions is 14 times higher than in the developed regions. Just half of pregnant women in the developing regions receive the recommended minimum of four antenatal care visits. Only an estimated 36 per cent of the 31.5 million people living with HIV in the developing regions were receiving ART in 2013."

Though these figures alone paint a worrying picture, global health stakeholders have since the creation of the MDG agenda grown increasingly aware that the world faces a number of critical, immerging global health challenges beyond those identified in the MDGs. When other significant and growing problems, including

noncommunicable diseases such as cancer and diabetes as well as injury and death from traffic accidents, are also considered, the picture becomes even worse. In 2015, 43 percent of premature deaths (before 70 years of age) globally resulted from cardiovascular disease, cancer, chronic respiratory disease or diabetes (UN DESA 2017). Furthermore, in 2013 death from road traffic injuries was the leading cause of death globally among males between 15 and 29 years of age (UN DESA 2017).

For this reason, emerging global health challenges have been better reflected in the subsequent and current global development agenda – the Sustainable Development Goals (SDG). In the SDGs a more comprehensive approach is also taken to health care access. As opposed to promoting access to a few specific health interventions such as vaccinations and antenatal care like the MDGs did, SDG 3 aims to achieve universal health coverage with "access to quality essential health care services and access to safe, effective, quality and affordable essential medicines and vaccines" (WHO 2019a). Recognizing the essential preconditions for this, the SDGs also aim to "increase health financing and the recruitment, development, training and retention of the health workforce in developing countries" (WHO 2019a).

2.2 Electricity and improving health outcomes

Arguably, a critical omission from SDG 3 on improving health outcomes relates to advancements in health care infrastructure. Though improved infrastructure, for example in the form of roads, is included as a target in a separate SDG 9, infrastructure improvements are not specifically reflected in any of the targets for SDG 3 on health. Still, there is little doubt that roads that facilitate the transportation of patients and health facilities that house patients are both essential to delivering quality health care and improving health outcomes. Equally important are water and electricity, which can be fundamental to the basic running of these health facilities. While addressing water scarcity and achieving universal access to energy are also set as targets in separate SDGs (SDG 6 and 7 respectively), no explicit link between energy, water and health care delivery are made in the SDG agenda, despite calls from experts to do so (Dora et al. 2015). In essence, improvements in infrastructure,

water and energy access are prerequisites for improved public services such as health care. Improved public services, in turn, can be a key condition for achieving SGD 5 on gender equality and women's empowerment. For example, better access to sexual and reproductive health care, particularly for women, is identified in SDG 5 as an important step towards achieving gender equality.

Though the linkage seems obvious, empirically establishing a correlation between a reliable electricity supply at health facilities and improved health outcomes of patients has proved difficult for energy-for-health researchers and advocates. The theory is that the quality of health services provided can be improved with access to electricity, and this will lead to higher recovery and survival rates. But empirically documenting this theory of change is difficult to do. For example, in 2013 the UK's Department for International Development (DfID) commissioned a study in which one of the objectives was to determine the net health benefits of renewable energy sources in remote health facilities (GVEP International 2013a). Such a determination required robust evidence of health impact from the provision of reliable energy, something the report authors were unable to identify (Ibid.). Their literature review concluded that, "A number of reports found in the review confirm our finding that there is little, if any, evidence showing the causal effect between electricity provision and improvement of health outcomes in a community" (GVEP International 2013b, 3). A more recent report from WHO and the World Bank also acknowledges an evidence gap stating that, "while it is clear many modern interventions cannot be delivered without electricity, few studies provide empirical evidence of the links between energy access rates of health facilities and actual health outcomes of treatment" (WHO and World Bank 2015, 18).

While it may seem odd that efforts to establish this link have not been made or at least have not been successful, the explanation is quite simple – controlling for other factors that impact health outcomes in a health facility is nearly impossible. "The impacts are difficult to measure due to the many contributing and confounding factors that need to be controlled, including staff skills and knowledge, availability of medicine, proximity to treatment and time-lag before measurable improvements" (Ibid.). Furthermore, according to the report commissioned by DIFID mentioned above, anecdotal evidence suggests that health professionals often find "work around

solutions" when there is inadequate electricity, further complicating efforts to attribute improved health outcomes to reliable electricity (GVEP International 2013a, 4).

Despite the empirical evidence gap, the global health community seems in agreement that a sufficient and reliable electricity supply in health facilities is in fact a precondition for improving health outcomes (WHO and World Bank 2015). Instead of showing to empirical, statistical evidence, global health actors rely primarily on logic to make this case (Arvidson, Songela, and Syngellakis 2006, Practical Action 2013, WHO and World Bank 2015). The rationale is that improved health outcomes will to a large degree result from better access to quality health services, which are often dependent on reliable electricity. One common argument is that electricity is usually required to pump water, and without water health facilities' hygiene and sanitation are compromised (WHO and World Bank 2015, 12). An inability to run sterilization machines also hampers efforts to prevent the spread of infection (WHO). Another important problem is that without power health facilities cannot run equipment such as refrigerators to store vaccines and blood or even power the most basic, lifesaving medical devices (WHO 2014, 82). Additionally, some qualitative studies, such as one produced by the International Network on Gender and Sustainable Energy, concluded that limitations in the form of inadequate lighting, cooling facilities and abilities to run diagnostic equipment, can significantly hinder health service delivery (University of Oslo et al. 2019, 62). Below is a table of potential benefits of stable electricity in health facilities provided by the European Commission and WHO.

Medical services	- Prolonged opening hours with general lighting and security lights provided - Wider range of services implemented, because more qualified staff are attracted to stay - Improved emergency surgical services - Better obstetric emergency care (many maternal deaths are due to birthing complications) - Improved management of childhood illnesses - Better management of chronic conditions - Improved referral system (radio communication system between peripheral and referral units) - Better sterilization procedures leading to fewer complications - Improved planning and quality assurance
Health and safety	- General cleanliness improves with adequate lighting and water available - Inpatients feel more comfortable and secure - Staff feel more secure - Security lights provided during evening open hours
Disease prevention and treatment	- Improved cold chain and vaccine storage conditions will yield lower immunization failure rates and better immunization coverage - Improved testing for HIV and TB - Evening awareness sessions are possible with general lighting and TV/VCR

FIGURE 2.1 Potential impacts of stable energy provision on health care delivery
Information from European Commission (Arvidson, Songela, and Syngellakis 2006); display from WHO and World Bank (WHO and World Bank 2015).

With these assumptions as the bases, efforts around energy-for-health appear to have largely skipped empirically documenting the implications of no or limited electricity access and instead moved straight to determining electricity gaps in the health sector and finding the best options to address them. For example, a study from 2013 that

reviewed energy access in health facilities throughout sub-Saharan Africa is frequently cited by energy-for-health advocates as evidence for why improvements are needed (Adair-Rohani et al. 2013). The study found that among the 11 African countries with data available, an average of 26 percent of health facilities did not have any access to electricity (Ibid.). Only 34 percent of hospitals were found to have 'reliable' electricity, which was defined as no outages of more than two hours in the past week (Ibid.). Similar efforts to document energy needs have been made under the United Nations Foundation's initiative 'Powering Health Care', which has conducted energy needs assessments for health facilities in Ghana, Malawi and Uganda (United Nations Foundation and ASD 2015c, a, b). Additionally, energy-for-health initiatives have developed several tools to help governments and health care managers assess energy needs, determine best electrification options and effectively manage energy at health facilities (United Nations Foundation and Sustainable Energy for All 2019, USAID , USAID).

While efforts to address energy gaps in the health sector have moved forward, research on the link between electricity and health outcomes remains limited. Efforts to isolate electricity as a variable and establish its correlation with improved health outcomes has not produced useful results. As Tanja Winther points out, "the use of electricity merges with other practices and technologies, and this makes it demanding to identify the effects that were specifically caused by electricity (attribution)" (Winther 2015, 161). In an article where she critiques an impact evaluation of a rural electrification project in Mozambique, Winther argues that understanding the impact of electricity requires a comprehensive approach that includes qualitative methods and "more often bringing in the questions of 'who', 'how' and 'why' when examining the topics on finances and electricity's acquisition and uses" (Ibid., 167). Such an approach goes beyond merely establishing correlation between a variable and a final outcome, which may provide mere confirmation of a decisive (or non-decisive) role of electricity. Instead a more in-depth, qualitative approach provides insight into processes, the various roles of actors within these processes, how dependent these processes and actors are on electricity, and finally how all of these impact outcomes. This methodology is more likely to produce explanations and other useful insights, for example by revealing surprising ways in which electricity is used or unexpected benefits. Additionally, it might uncover work-around solutions for

getting by without electricity or even reveal negative consequences of electricity access.

In this sense, it appears the best place to start investigating the role of electricity in health care and health outcomes is to take a comprehensive look at the interplay between electricity and the procedures and actors that utilize it in health service delivery. As Vasant Narasimhan et al. point out, "where the workforce is available and competent to undertake the tasks, there are several forces, both within the health-care system and external to it, which diminish their potential contribution" (Narasimhan et al. 2004, 1469). Access to electricity is likely one of these 'forces'. Although the interplay between electricity and the procedures and actors that use it in health care is also a rather poorly researched area, some evidence exists. According to a Voluntary Services Overseas (VSO) report from 2012, Ugandan health workers were found to face a number of obstacles related to unreliable electricity in their daily work including basic challenges such as reading patients' case notes to performing post-surgery stitching in dim or no lighting (HEPS-Uganda, VSO Uganda, and VSO 2012, 16). The importance of considering different effects on different actors also became apparent in the study, as nurses told of challenges related to seeking consultation or assistance from senior doctors when communications systems were down due to a lack of electricity (Ibid.).

2.3 Electricity and retention of human resources for health

Interestingly, in the VSO report health workers not only pointed to the negative implications a lack of electricity had on their patients; there was equal concern for their own safety. Fear of contamination from infected blood when working in the dark was mentioned, as was the fear of being assaulted when working in unlit wards or crossing dark work compounds (Ibid.). This highlights another potentially important role of electricity in the global health response – creating satisfactory working conditions for the health workforce and thereby retaining them in their jobs. It is important to recognize that though electricity is an essential resource for health systems, an even more critical resource are the health workers that utilize the

electricity – the ones that deliver the care. Despite health workers being the backbone of health systems, several LMIC struggle to maintain heath workers' motivation and retain them in public clinics and hospitals, particularly in rural areas. In global health discussions, demoralization and high attrition among health personnel are often cited as barriers to improved mortality and morbidity rates in the Global South (WHO 2006).

> "Human survival gains are being lost because of feeble national health systems. On the front line of human survival, we see overburdened and overstressed health workers, too few in number, without the support they so badly need—losing the fight" (Chen et al. 2004, 1984).

To remedy this gap, numerous efforts have been made to identify and understand reasons for low workplace motivation and retention within health sectors, as well as effective interventions for how to address these issues (Dussault and Franceschini 2006, Rowe et al. 2005, Willis-Shattuck et al. 2008). Findings point to a variety of contributing factors, including inadequate compensation, a lack of opportunities for professional development, unmanageable workloads, and poor management (Ibid.). Additionally, research indicates health workers in LMIC contexts are often discontent with their work environments, including infrastructure deficiencies and an inadequate supply of equipment and supplies (Ibid.). While conducting the literature review for the current study, no studies were found that specifically identify a lack of electricity as a demotivating factor. However, this is not necessarily an indication that inadequate electricity is not regarded as a problem. Previous studies have primarily been survey based, and it appears from these studies' findings that electricity may not have been included as a possible answer choice. In other words, the fact that health workers have not identified a lack of electricity as a demotivating factor may simply be because they were not given the option to do so. In fact, it appears that in the surveys used in these quantitative studies, researchers have assessed satisfaction with equipment availability rather than starting with the electricity needed to power that technology.

2.4 Electricity and women in the health sector

Maintaining and even bolstering the health workforce in LMIC will be essential to meet global health goals. This will require strong participation from both women and men in the sector. Women's participation in the health sector may also be important to achieve another global development goal – SDG 5 on gender equality and women's empowerment. Recognizing that increased participation in the workforce can be both a means and an end to women's empowerment, the global development agenda has placed increasing focus on facilitating women's entry, retention and progression in the labor force. For example, one of the targets under SDG 5 on gender equality and women's empowerment is to "ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life." Another is to "end all forms of discrimination against all women and girls everywhere." The health sector is a particularly interesting employment sector in this regard given that women, due to the care-giving role society has traditionally prescribed to them, have historically been heavily involved in it. For example, in many parts of the world midwives, nurses and community health workers are overwhelmingly considered 'women's professions'. WHO estimates that globally women hold 70 percent of positions in the health care sector (WHO 2019c).

However, though women's strong participation in the health sector is laudable, the positions they hold tend to have relatively low status within the health care system. This means the jobs women hold are likely to be low-paid (often voluntary), undervalued, insecure, less autonomous and under-resourced (Langer et al. 2015). WHO estimates that globally 50 percent of positions held by women in the health sector are unpaid (WHO 2019c). Especially in countries where societies are influenced by high levels of patriarchy, men can be overly represented in leadership and influential roles. Medical director, physician and medical officer positions as well as trainer roles can be disproportionately filled by men. As stated in a 2007 report for the WHO Commission on Social Determinants of Health, "Gender, among other power relations, plays a critical role in determining the structural location of women and men in the health labor force" (George 2007, 5). The report goes on to note that the variations in the way each gender's work is recognized, valued and

supported has different consequences for their professional life (e.g. career trajectories, pay, training and other technical resources) as well as their personal life (personal safety, stress, autonomy, self-esteem and family relationships) (Ibid.).

To tackle the world's enormous global health challenges the contribution of women health workers will be essential. Not only will they play an important role in addressing human resource supply challenges, but they may even help address gender barriers associated with low demand for health services. Evidence suggests a lack of female providers can be a major impediment to women seeking maternal health care (Pettersson et al. 2004, Portela and Santarelli 2003). For these reasons, it is important that women remain in the health care sector and take on more senior roles. Though proposals for making human resource policies in the health sector more gender equitable and responsive have been made (Standing and Baume 2000), gender imbalances in the health care hierarchy persist, particularly in LMIC. This may indicate a need to think beyond traditional barriers and solutions. Gendered access to and use of a resource such as electricity may be an area to consider. Though the SDGs do not address women's access to electricity explicitly, they do mention improvements in infrastructure, public services and access to technologies, all of which include or require electricity, as preconditions for achieving gender equality. While there do not appear to be any studies conducted specifically on access to electricity and its relation to women's empowerment in the workplace, similar studies have been conducted at the household level. A literature review conducted by Winther et al. on women's empowerment and electricity indicates that in general electricity access leads to positive improvements in the lives of women, for example by reducing time spent on household work and increasing access to information through television (Winther et al. 2017, 398-9).

Furthermore, though they do not look at electricity broadly, some studies have considered the role of technology (a resource that requires electricity) in empowering women, particularly community health workers, in their workplace (Buehler, Ruggiero, and Mehta 2013, Trause et al. 2014, Tariq and Durrani 2018). Findings have, however, been mixed. On the one hand there are indications that technology support these women, for example, by giving them better access to online health information and improved methods for large scale health surveillance (Trause et al.

2014). On the other hand, one study pointed to how mobile information and communication technologies were not very useful for female community health workers in Pakistan. The technology these women utilized was not always accepted by their clients, which the researchers partially attributed to the women's low social status and unfavorable societal attitude toward them (Tariq and Durrani 2018). "The study found that these barriers adversely impact both LHWs' [lady health worker] initial adoption of mobile devices as well their inclination to continue using mHealth solutions" (Ibid., 7). These mixed findings are an indication that the use of electricity in the workplace may be gendered and the consequences of this should be examined.

3. METHODOLOGY

In a study that seeks to understand daily work actions, a methodological approach is needed that allows for exploration of how different people perceive and react to the world around them. Using Jonathon W. Moses og Torbjorn L. Knutsen's methodological distinctions between naturalism and constructivism, the current study needs a constructivist approach. Rather than trying to fit human behavior into patterns and absolute truths as naturalists would, constructivists recognizes "that people are intelligent, reflective and willful, and that these characteristics matter for how we understand the world" (Moses and Knutsen 2012, 10). As stated by Moses and Knutsen (Ibid., 9):

> "For these social scientists [constructivists] the patterns of interest are not firmly rooted in nature but are a product of our own making. Each of us sees different things, and what we see is determined by a complicated mix of social and contextual influences and/or presuppositions."

Though a constructivism methodology is not synonymous with qualitative methods, just as a naturalist methodology is not synonymous with quantitative methods, there is a tendency for researchers to use these two approaches according to this methodological division. As Sian Sullivan and Dan Brockington state, "Qualitative methods are used to explore the meanings of people's worlds – the myriad personal impacts of impersonal social structures, and the nature and causes of individual behavior" (Brockington and Sullivan 2003, 57). Qualitative methods can be used to develop additional layers of insight, insight that often does not fit into testable theories but still may be critical to our understanding of situations. In the social sciences, researchers rely on both quantitative and qualitative methods, but perhaps quantitative methods have historically been seen as most valid. As John Overton and Peter van Diermen point out, "there are many researchers who rely on quantitative techniques because they believe that only these techniques allow us to uncover verifiable and meaningful 'facts' that have scientific validity" (Overton and van Diermen 2003, 37). Quantitative techniques "allow us to gain a picture of broad patterns and phenomena" and have thus traditionally been believed to be the best source of evidence to, for example, inform policy (Ibid).

A belief in the superiority of quantitative data has perhaps been particularly dominant among medical and public health researchers, which could explain why previous studies that look into health workers' conditions in the workplace have relied heavily on quantitative methods. The experiences of workers in health care systems in LMIC have in the past largely been studied in order to find solutions to demotivation and poor performance in the workplace. These studies tend to utilize surveys and standardized interviews on topics such as compensation, affirmation from leadership and training opportunities to identify categorical areas of dissatisfaction among workers (Borghi et al. 2018, Dussault and Franceschini 2006, Willis-Shattuck et al. 2008). In other words, methods have largely been quantitative and so contextual factors have received limited consideration. The findings of these studies usually take the form of statistics that indicate which factors, among a limited, predefined set of options, most and least influence workplace satisfaction and motivation. While previous studies with a quantitative approach have produced useful findings, they are arguably not taking a comprehensive look into the complexities of the everyday realities workers in the health systems of LMIC face. For example, instead of simply producing lists of what health workers like and dislike about their situation, it could be more telling to investigate why and when they are made to feel this way. People's particular circumstances, experiences and knowledge will impact their feelings, the way they exercise their agency and also their behaviors. Neglecting these realities and reducing human complexities to an 'objective' pattern or formula may disregard some important aspects of human behavior.

For the current study on electricity and its role in daily actions at the hospital I veer from the traditional quantitative approach in health research and utilize a case study approach with qualitative methods. Alexander L. George and Andrew Bennet describe the case study approach as "the detailed examination of an aspect of a historical episode to develop or test historical explanations that may be generalizable to other events" (George and Bennet 2005, 5). They see case studies as "the subset of qualitative methods that aspires to cumulative and progressive generalizations about social life and seeks to develop and apply clear standards for judging whether some generalizations fit the social world better than others" (Ibid., 19). George and Bennet

identify four advantages of using case study methods to test hypothesis and develop theories: “their potential for achieving high conceptual validity; their strong procedures for fostering new hypotheses; their value as a useful means to closely examine the hypothesized role of causal mechanisms in the context of individual cases; and their capacity for addressing causal complexity” (George and Bennet 2005, 19).

Through a case study approach and using qualitative methods I hope to provide a deeper understanding of the realities faced by health workers in Ethiopia, the daily actions they take as a result of these realities, and the consequences these actions have for the health care they deliver. I seek to uncover information about a context and the processes that occur within it, information that mere data cannot portray. I attempt to go “beyond numbers to consider the meanings of quantitatively derived findings to the people they affect, and to problematize, rather than accept uncritically, the production of such data” (Brockington and Sullivan 2003, 59). In a sense, I aim to develop a ‘thick description’, the concept coined by British philosopher Gilbert Ryle that stems from his belief that a deeper understanding of motivations and intentions is needed to decipher the meanings of people’s actions (Geertz 1973, 312). Clifford Geertz calls this the “piled-up structures of inference and implication through which an ethnography is continually trying to pick his way” (Ibid., 313). Though the timeframe for my research did not allow for sufficient submersion into the hospital context to conduct an in-depth ethnographic study, Geertz’s statement still sums up what I attempted to do while in the field.

In the remainder of this chapter I describe the country and the particular hospital I selected as my research site (case) and justify this selection. Next, I explain the processes I followed to conduct my research, including my use of interviews and participant observation as research methods. Finally, I reflect on potential biases I have had to be mindful of throughout my research.

3.1 Case selection: A rural Ethiopian hospital

Despite making important, globally-applauded health strides the past years, Ethiopia still faces substantial obstacles in delivering quality, comprehensive health care to the country's 100 million population. In a relative perspective, in 2014 Ethiopia had a per capita health expenditure of 73 USD, compared to Norway's 6,347 USD per capita spending the same year (WHO 2019b). From 1998 to 2016, Ethiopia's physician to population ratio was 0.025 per 1,000 population, while Norway's ratio was 4.385 to 1,000 (Ibid.). Particularly rural areas, where the largest part of Ethiopia's population live, are experiencing the brunt of the health service provision gap. Ethiopia's relatively low life expectancy of under 66 years and high maternal and child mortality rates are in many ways a result of a still insufficient health care system (World Bank 2019). The current Ethiopian health care system is overstretched and finding ways to improve it is paramount.

Ethiopia is a particularly interesting context in which to look at energy use in the health care sector. Even compared to other low-income countries, Ethiopia faces a particularly daunting challenge with regard to electrification. The World Bank's latest figures indicate that only 27.2 percent of the population in Ethiopia has access to electricity, a rate lower than the sub-Saharan average (World Bank 2017). However, as Ethiopia seeks to become a middle-income country through industrialization by 2025, electricity has in recent years taken center stage as a precondition. Ethiopia is currently implementing a plan to raise output to over 17,000 megawatts (MW) from a present capacity of just over 2,200 MW using hydropower, wind and geothermal sources (Maasho 2016). Among other projects, in 2011 Ethiopia began constructing the Grand Ethiopian Renaissance Dam, which when completed will be Africa's largest hydropower plant (Ibid.). Ethiopia's current policy-focus on energy coupled with a pressing need to address challenges related to an overstretched health sector contributed to making the country a compelling setting for this research project.

Ethiopia is also an interesting setting in which to assess the particular circumstances women face. Surveys consistently find that Ethiopian women often have low status within their communities. One in three Ethiopian women experience physical, emotional or sexual violence and 65 percent have experienced female genital mutilation (USAID 2018). Similarly, education for girls is generally not a high

priority with only half of girls enrolled in primary schools making it to fifth grade (Ibid.). Given the low status women face in society, it could be assumed that such a status is pervasive in workplaces as well. This would likely mean that women face discriminatory barriers to succeeding there. This is particularly unfortunate since securing employment for women and retaining them in the workplace will be important steps towards achieving economic equality for women in Ethiopia. Interestingly, just in the past two years Ethiopia has experienced significant political changes, including the appointment of a new male prime minister that has made the empowerment of women his personal cause. Among other steps, he has placed an unprecedented number of women in strategic leadership positions in the highest levels of government. These actions took many Ethiopians by surprise because of the low status so many women face and has led to much national dialogue around the topic of gender equality. In addition to the low social status Ethiopian women hold and the potential discrimination they face in the workplace, current discourse around women's roles in society also made Ethiopia a particularly interesting location for my research.

Finally, Ethiopia was selected as the location for my study because I have six years of experience developing and managing projects on sexual, reproductive and maternal health there. During those six years I held positions with a civil society organization, the United Nations Entity for Gender Equality and Women's Empowerment (UN Women) and a private charity hospital. This gave me unique previous insight into Ethiopian society and the country's health system that served an important role in my observations and interpretations of my informants' responses.

A case study methodology was adopted to ensure an in-depth understanding of actions related to the use of electricity and electric equipment among staff in one rural Ethiopian hospital. To ensure the anonymity of study participants, the name of this hospital will be withheld and from here on be referred to as the Hospital. The Hospital is located in the southwestern part of Ethiopia in Bale Zone of the country's most populous region, the Oromia Regional State. Its distance from Addis Ababa, Ethiopia's capital, is over 500 km. The closest large, more urban town is located about 125 km away. The road between the small town where the Hospital is located and this larger town is not paved and can be difficult to pass, especially during rainy

seasons. When the road is in good condition, I was told the drive could be made in 2.5 hours. Under very rough conditions, if passable at all, the drive could take up to four. A senior leader at the Hospital estimated that the Hospital serves as a referral institution for a catchment population of approximately 1 million people. There are also other smaller health facilities with a more limited number of health services available, such as health centers, that serve the same population. The 1 million catchment population includes a number of people from neighboring zones that have even poorer health facility coverage than Bale. During the last Ethiopian calendar year[1] nearly 60,000 patients (outpatient and inpatient) were attended to at the Hospital.

One of the primary reasons the Hospital was selected as my research site is that I had established contacts there, which presented good opportunities for access to key informants and a higher probability of a good reception. A family member of mine has worked, seconded by a nongovernmental organization (NGO), at the Hospital for a three-year period and could thus provide valuable assistance in preparation for and the conducting of this study. Firstly, she helped me initiate communication with the Hospital's leadership to obtain research approval and a formal invitation to come. Secondly, she introduced me to a number of study informants and vouched for my credentials and research purpose, which I believe helped establish credibility in the eyes of informants. It should also be noted that my relative served as a key informant in this study, and especially helped me map out people and points of particular interest. The potential drawbacks and biases that could result from relying on a family member as a key informant will be discussed further in a section below.

I deliberately decided to focus on one hospital instead of multiple locations due to the limited timeframe of such a research project. This was done in order to get an in-depth understanding of one place rather than a simple snapshot from various places. It should be noted that this approach did not allow for comparison to other health facilities, which might have provided valuable information. Furthermore, though it

[1] The official calendar used in Ethiopia stems from the Coptic church and has 13 months. Consequently, there is currently an eight years numeric delay between the Ethiopian calendar and the Gregorian one. I conducted my research during 2018 of the Gregorian calendar and 2011 of the Ethiopian calendar.

can be assumed that certain conditions in the selected location are common throughout the Ethiopian health care system, it would be inaccurate to assume that findings from this study can be generalized throughout the country.

3.2 The research process and selected methods

Prior to arriving at the Hospital, I went through a series of steps to attain local research approvals to facilitate data collection, including obtaining a letter of support from the regional health bureau and zonal health office under which the Hospital is administered. With this I was able to initiate a dialogue with Hospital leaders and eventually received an invitation to conduct the research. I arrived in the town where the Hospital is located in mid-September 2018 and left mid-October. I spent a total of four full weeks conducting fieldwork. I began my time at the Hospital by meeting with the leaders I had communicated with prior to my arrival. They gave me a brief overview of the Hospital and introduced me to a few key people to speak with to help get my research started.

Since I could not in the span of four weeks thoroughly observe each department at the Hospital, my first task was to determine where my time would be most strategically spent. To decide this I mapped out the Hospital's departments according to their electricity situation – where there was grid electricity and where there was one or multiple backup electricity sources. This was done in partnership with my initial contacts at the Hospital. Information from this mapping exercise is presented in detail in the findings chapter below. I then used this information to rank the departments by 'electricity security'[2] on a scale from least to most electricity secure. From this ranking I selected the departments to focus on with the purpose of having the least, average and most electricity secure locations all represented in the study. The departments I decided to focus on included:

- Administration
- Delivery ward
- Imaging unit

[2] I defined this as where electricity was most available.

- Intensive care unit (ICU)
- Kitchen
- Laboratory
- Neonatal intensive care unit (NICU)
- Obstetrics and gynecology ward (Ob/Gyn)
- Operating room (OR)
- Outpatient department (OPD)
- Pharmacy

After selecting the departments in which I would focus my research, I began recruiting staff to interview and observe. On my initial visit to a department I always brought someone along to introduce me. I then explained my purpose for being there, gave details on my project, explained what participation in the research would entail, reassured everyone that participation was completely voluntary and anonymous, and then asked who was interested in being interviewed. Those who expressed interest were given a consent form[3] that further explained the research purpose and process. The form also guaranteed participants' full anonymity. I had prepared this form in three languages – Amharic (the official language of Ethiopia), Oromo (the regional language in the area), and English. Though I spoke with a number of staff informally at the Hospital, only statements from those who signed the consent form have been used in this report. However, the informal talks influenced what I paid attention to and areas I explored.

3.2.1 Interviews

During my time at the Hospital I interviewed a total of 22 staff members[4]. All worked in one of the 'focus' departments listed above. In the selection of study participants, I tried to ensure a balance between senior and lower level staff in each department and included both men and women. Though I was somewhat successful

[3] See Appendix 1
[4] See Appendix 2 for a list of respondents, their roles at the Hospital and their gender. Names and certain respondent characteristics that were considered as part of the research (including specific positions, age and number of years worked at the Hospital) have been withheld from this list to ensure anonymity.

at obtaining this balance, there were constraints that made it challenging. Due to busy workdays, interviewees often had to be selected on the basis of availability. I would go to the department I had decided to focus on that day and ask if any staff members had time to spare and were willing to talk to me. Often I was able to start interviews, but there was not always enough time to complete them. In these cases, I returned at another point to complete the interviews.

Additionally, due to informants' busy days, interviews were always conducted in the department where the informant worked; never were staff able to leave and go somewhere else to talk. This meant interviews were rarely conducted in private. Privacy was only possible if the informant had a private office or in the rare case that a breakroom was free. It is possible that a lack of privacy due to other staff and patients being around during interviews can have impacted the openness and honesty with which informants spoke to me. This, in turn, may have influenced my findings.

The participant-recruitment approach of entering departments and seeing who was available allowed for some randomness in the selection of informants. This was good as it gave variation in perspectives, but it did not ensure the inclusion of key people who might have important supplementary information or unique insights. To ensure I did not miss these individuals, I noted the names of people who were repeatedly mentioned in interviews and later sought these people out and scheduled and conducted interviews with them.

Interviews were conducted around a semi-structured interview guide[5]. There were nine topics in the guide, but not all were discussed in each interview. Under each topic there were specific questions on gender when this was relevant. The topics included:

1) How electricity is used
2) The supply and consistency of grid electricity
3) Maintenance and repair of electrical equipment
4) Use of backup electricity sources
5) Decision-making regarding use of backup source(s)

[5] See Appendix 3

6) The impact of electricity outages on work
7) Impact of electricity outages on wellbeing and motivation
8) Impact of electricity outages on patients
9) Administration at the Hospital and government relations

Questions under the various topics were designed to gain an understanding of electricity availability and equipment usage, as well as to explore how the health system impacted this. While I aimed to ensure that all topics were properly covered, interviews often had an informal tone and conversations regularly veered from the interview guide. I believe this allowed me to explore interesting but unforeseen topics that have added value to the research.

Since I had to strictly adhere to principles of patient confidentiality and interviews were usually conducted in settings with patients around, I decided not to use a recorder for any interviews. If I unintentionally also recorded patients, this had, first of all, not been authorized and secondly could put their confidentiality in jeopardy. While conducting interviews I diligently took notes on a notepad throughout and then typed out and cleaned up the notes on my computer afterwards. All interview notes were typed up the same day the interview was conducted to ensure best memory and accuracy of information.

All interviews, except one, were conducted in English with intermittent Amharic to ensure clarity. The reason interviews were mainly conducted in English was twofold. First, though I have lived in Ethiopia for numerous years, I still did not feel my Amharic proficiency was good enough to understand all the information shared by informants. Secondly, though I had received research clearance from the government and Hospital, and thereby had permission to enter the Hospital wards, such clearance had not been granted to a translator. I did not wish to break any ethical standards by breaching patients' privacy or push the limits of my clearances by bringing an unauthorized translator in. Additionally, early in my fieldwork an informant pointed out that bringing in an outside translator, especially one from the surrounding area, might be uncomfortable for and unwanted by patients. For these reasons, I decided to rely solely on Hospital staff to help with translation. However, as has already been stated, staff had busy schedules and had minimal time to be interviewed, let alone to serve as translators. Thus, I tried as best as possible to rely on English. To interview

the one informant that did not speak English, I was able to recruit another Hospital staff member to assist me with permission from the participant.

Though the level of English proficiency among participants varied, everyone whose interview was conducted in English was able to understand the questions I posed and answer accordingly. However, I could tell some informants felt more comfortable elaborating and going into details than others, a fact that may have restricted the information I was able to collect. Particularly female respondents were more reserved in their communication, something that will be further discussed below. Though there may have been various explanations for this discomfort, language proficiency appeared to be one of them. Women's English proficiency was generally lower than that of men.

3.2.2 Participant observation

When I was not interviewing staff in the wards, I was making observations about their actions, reactions, routines and deviations from routines, especially as they related to the use of electricity and electric equipment. I paid particular attention to gender differences, as well as variations between senior and junior staff. I was also continuously observing the availability of grid electricity at the Hospital and use of backup electricity sources. To record my observations I followed the same procedure as for notes taken under interviews; I used a simple notepad and later typed my notes out on a computer. In addition to observations my notes included my own reflections on what I had heard and observed throughout the day.

The daily routine at the Hospital followed a fairly standard format – in each inpatient ward the day began with morning rounds. Morning rounds were performed by a small group of staff in their designated departments and were used to determine status updates on patients. During these rounds decisions were made about patients' further treatment as well as whether surgery or referral to a higher hospital was needed. The remainder of the day staff spent administering the treatment decided on or performing required surgeries and deliveries. The Hospital also had a clinic area

for outpatients. Here patients could consult and be evaluated by a health worker as well as receive child vaccinations and antenatal care.

I usually started my day at the Hospital during morning rounds. Staff were generally not available to talk then, so this became an important time for observation, with intermittent explanations from staff about what they were doing. Generally, I would leave the Hospital for lunch and return in the afternoon to a different department. In other words, I visited two departments on average each day. I would then leave the Hospital around 4:30 pm.

This research method, participant observation, stems from anthropology and the ethnographic research approach. In the words of Brockington and Sullivan, "ethnographic approaches aim to be 'actor-oriented' in their attempts to convey reality from a subjects 'point of view'" (Brockington and Sullivan 2003, 65). Participant observation seeks to ensure "the legitimacy of a researcher's interpretation of observed cultural phenomena from their participation and immersion in these phenomena" (Ibid.). Though 'submersion' into the Hospital context would have been ideal for this research project and perhaps produced more rigorous findings, the timeframe for my fieldwork unfortunately did not allow me to become 'a part of the Hospital' in the way that an ethnographer would seek to be. Thus, I cannot say that my project allowed for participant observation in the true ethnographic sense of the word. Still, I found that the opportunity to follow people as they were doing their work gave me useful insights that I would have overlooked had I only relied on interviews. My observations also helped me identify topics to probe interviewees on that I might otherwise have missed.

However, the participant observation process was a bit hampered by a variety of factors. Finding a balance between observing and respecting patient's privacy proved challenging. I was hesitant to inserting myself, a stranger who was visibly not a health care provider, into the health care experience of patients who were already feeling discomfort from pain and exposure. Consequently, I chose not to participate in any private doctor-patient examinations. Instead I remained in the multi-bed wards, ICU and NICU where patients were resting or in the staff breakrooms. Additionally, I was never able to enter the OR while an operation was ongoing. I was

only allowed to observe this space when it was not being used. In other words, there were several situations in which electricity and electric equipment were important, or even critical, that I only heard about but did not observe during my time at the Hospital.

Another challenge was that I often experienced that staff felt obligated to pay attention and speak to me while I was conducting my observations. Despite repeated attempts to explain, it was difficult for them to understand the purpose of me simply being there to watch. They sometimes seemed to feel a need to 'entertain' me or at least keep me occupied. Consequently, I often felt like a distraction from their work, which I feared negatively impacted patient care. When I felt this way, I would usually retract myself from the situation. Additionally, due to the technical nature of their work, there was little opportunity for me to join or participate in staff members' activities, which could leave me feeling in the way. None of the staff ever got fully used to seeing me in their departments, so my presence never became completely natural. This was probably just as much a result of the limited timeframe of my fieldwork as it was my inability to participate in staff members' work. It is possible that since I never became a 'natural' part of the situation, my presence may have influenced what was said and done.

A final constraint to the participant observation process was not having around the clock access to the Hospital. Though the Hospital was always open, staff did not feel safe moving about town after dark. This meant shifts started and ended before sunset and after sunrise. Any staff on-call stayed on the Hospital compound during the night; no one was expected to come or go after dark. As a safety measure, I decided to follow the same procedures. This meant I had to leave the Hospital before dark and could not be there during night hours. The only exceptions were two times when I was offered car transportation home and was thus able to stay into the evening hours. Still, out of a 24-hour day, I was only able to observe about eight to nine of those hours. Presumably, there were things of interest to this study that happened during the other 16 to 17 hours. Unfortunately, though, it was just not feasible to cover this.

3.3 Self-reflection and potential biases

Throughout my fieldwork, self-reflection was required to better interpret the motives and meanings behind what I was observing and being told. I had to reflect on who I was in relation to study participants, including power dynamics and roles, as well as whose voices I was allowing to play most dominantly into the picture I was forming. Below is a brief reflection on a few of these points.

3.3.1 Who was I to informants?

An important question to consider particularly in this type of research is: who do informants think the researcher is and what is the researcher's objective? I imagine assumptions at the Hospital about who I was were strongly formed by previous experiences informants had with similar people. From personal experience, I know that health facilities in Ethiopia are mainly visited by government officials or development workers. Development workers come to conduct 'needs assessments', or to uncover deficiencies related to, for example, equipment and staff, in order to determine how their organizations can partner with health facilities. Alternatively, development workers come to assess the progress of their ongoing interventions and are often particularly interested in identifying positive developments. Visits from others, including academic researchers, are much less common. Though I attempted to make it clear that I was not performing any assessment, nor was I sent from an organization that would ultimately bring new resources, it would not be unthinkable that informants made assumptions that I had a similar agenda as development workers they had encountered or heard of in the past. In fact, study participants making assumptions about the identity or alternative roles of researchers is not an uncommon occurrence, and other researchers have also considered the potential biases this may cause. For example, in her study on the impact of electrification in a Zanzibar village, Tanja Winther reflects on the implications of being perceived by villagers as a Norwegian engineer involved in the village's electrification process instead of a researcher (Winther 2008, 10).

If it was assumed that I had an agenda beyond mere research, it is possible information provided by my informants was affected by this. If informants assumed I was doing a needs assessment that would result in new resources, they may have been more likely to keep a negative focus and emphasize gaps and challenges. And in fact, there were times when I felt certain informants heavily unscored problems, perhaps even portraying their situation as more despairing than it was. Other informants appeared reluctant to speak negatively, perhaps afraid that a poor assessment would have negative consequences for future development funding. This happened despite my persistent efforts to communicate that all respondents would remain anonymous.

Fortunately, throughout my stay at the Hospital I experienced that staff's perception of who I was became more and more accurate. My stay was much longer that those of previous development worker visitors they had encountered, something I believe was crucial to 'disconnecting' me from them. The longer length of my stay also allowed staff to get to know me, which eventually led to trust-building and a better understanding of who I was. Conversations began flowing more freely and honestly as staff became more comfortable with my presence and more convinced that I had no particular agenda. Though this was a positive development, I cannot be fully certain that information I collected was not affected by false perceptions of who I was.

No matter what Hospital workers perceived the purpose of my stay to be, the mere fact that I was a guest presumably also impacted my interactions with them. In my experience, guests in Ethiopia are to be treated with respect, which often entails not disagreeing with or correcting them. This status meant that when I made statements to staff about my observations or analysis to test their accuracy, I frequently received positive confirmation that I had understood correctly, even when I later realized I had in fact not. Fortunately, from previous years of working in Ethiopia I was familiar with this type of false confirmation deriving from politeness. I thus knew I had to be very aware of how I formulated myself and carefully ensure that I did not put words in informants' mouths that they were uncomfortable disputing.

3.3.2 Whose voices were heard?

When conducting research that relies heavily on non-standardized interviews, the researcher can be left with significant power to determine whose voices are given the most weight. Responses the researcher finds most compelling, understandable or relatable might be prioritized or receive more emphasis in research findings. For this reason, I had to make a conscious effort to ensure that a spread of voices and perspectives were reflected in my research. Below are various issues I thus had to reflect on throughout the research process.

As mentioned earlier, one of my family members worked at the Hospital and served as a key informant during my fieldwork. This family member provided me with a lot of detail, helping me form an important initial picture of daily routines at the Hospital, electricity conditions there, and related problems staff faced. I was also frequently able to discuss my observations with her to try and make sense of them. Due to our similar reference points and the ample access I had to her, it would have been easy to rely heavily on my family member's perspective and the information she provided. Since this would have given me a very narrow perception of the situation I was researching, I had to make a conscious effort not to rely too heavily on what she told me. I always verified the information she gave me with other informants at the Hospital, and often used it to identify topics to ask other staff to elaborate on.

Of the 22 staff members I interviewed, two were expatriate staff, one of which was my family member. The insights of these expatriate staff provided an interesting perspective, as they were able to compare their experiences at the Hospital with their experiences from working in American and European health systems. Despite providing a compelling comparative view, I had to be conscious to not over relying on these two informants. As international staff, with salaries paid and employment conditions set by an international NGO, the realities they faced were in many ways different from that of their Ethiopian counterparts. For example, if they had equipment needs, they could bring requests to their NGO employer, an option not available to the Ethiopia staff. The experience of the two expatriates did not

necessarily reflect the experience of the majority, and thus I had to be mindful to not make such assumptions.

Finally, though there was gender balance in the group of informants I interviewed, women were more reluctant to speak to me than men. As mentioned earlier, this may have been due to a lower level of English proficiency among female staff than males. Social and cultural expectations that women appear reserved may also have contributed. Getting enough women to agree to be interviewed was a slight hurdle but getting them to share more than short sentences was even more of a challenge. In other words, despite there being a near equal number of men and women informants, the input of men could easily have dominated my research findings. To ensure women's voices were equally heard, I had to deliberately ask women more probing questions to get them to elaborate on their answers.

4. THEORETICAL FRAMEWORK

To interpret my research findings I anchor my analysis of staff, their surroundings (health care bureaucracy, electricity, electric equipment and electric light) and their production of health services in practice theory. Below is an explanation of the distinguishing features of practice theory as well as two applicable, related concepts – 'technology script' and Bourdieu's forms of capital. Following my general presentation of each of these theories and concepts, I explain the key elements on which I base my analysis.

4.1 Practice Theory

In this section I seek to explain the defining features of the cluster of theories labeled practice theory and describe how I will utilize these perspectives in my upcoming analysis. I begin by placing practice theory in a historical perspective, particularly focusing on its origins and the limitations of previous social theories that engendered its development. I proceed to explain the distinction between socially significant practices, as opposed to mere actions, before defining what I will consider as practices in my own analysis. Finally, I consider some key aspects and central concepts of contemporary practice theory, including socio-material histories, habitus and embodied predispositions for action and explain how these elements and concepts will be incorporated into my analysis.

4.1.1 Social theory and the origins of practice theory

In broad terms, modern social theory considers how societies change and develop, how social behaviors can be explained, and the role of power and structure in forming social life (Harrington 2004, 1). Since its emergence social theory has developed three fundamentally different ways of explaining action and social order (Reckwitz 2002, 245). The first is based on rational choice and assumes that humans make decisions and take actions with the aim to optimize their situation (Ibid.). It explains action by "having recourse to individual purposes, intentions and interests;

social order is then a product of the combination of single interests" (Ibid.). The second is norm-oriented and assumes human behavior is "shaped, molded, ordered, and defined by external social and cultural forces and formations," also referred to as 'structures' (Ortner 2006, 1). Here, actions are explained by "pointing to collective norms and values, i.e. to rules that express a social 'ought'; social order is then guaranteed by a normative consensus" (Reckwitz 2002, 245).

The third approach to explaining action and social order arose partly as a reaction to structuralism (Ortner 1984). As Sherry Ortner puts it, "a purely constraint-based theory, without attention to either human agency or to the processes that produce and reproduce those constraints – social practices – was coming to seem increasingly problematic" (Ortner 2006, 2). Until this point, social theory had not properly accounted for the innovative capacities of humans, nor had it addressed the evolving nature of social structures. Practice theory was introduced by theorists such as Pierre Bourdieu and Marshall Sahlins in the late 1970s and early 1980s as an answer to these concerns. In essence, practice theory brought increased attention to agency as a consideration for understanding human actions and changing social order. As Ortner says, "[t]he actor is not viewed as a free agent, engaged in unconstrained creativity on the one hand or manipulation on the other" (Ortner 1989, 14).

4.1.2 Distinguishing practices from actions

From a practice theory perspective, practices are viewed as the "fundamental component of social life" or the "central phenomenon in the tangle that is human sociality" (Schatzki 1996, 12). Practice theorists believe it is through practices that people 'coexist' or their 'lives hang together' (Ibid., 14), making them essential units to be studied to understand social order and meaning. In other words, practices are seen as "primary entities of the social word" and "core to social science analysis" (Warde 2014). Since they are ascribed such an important role in social theory and particularly practice theory, it is important to clarify exactly what practices are and what they are not in preparation for the coming analysis.

As Alan Ward points out, within the field of practice theory there is no universal agreement on "which activities shall be considered as practices, nor how the boundaries to a practice might be constructed, commonly recognized, and sociologically analysed" (Warde 2014, 285). He elaborates on this challenge by stating (Ibid., 291):

> "The difficulty is to reconcile the fact that performances are very varied with claims that they are instances of a common and recognized Practice; how can boundaries of a Practice be drawn in order to justify treating it as more than random personal activity and instead subject to collective formulation and regulation?"

Warde is identifying the challenge of distinguishing between practice as an arbitrary action and practice as a socially significant action guided by social norms. Reckwitz's distinction between practices and 'the elements that go into practices' helps address some of the definitional challenges Warde identifies. Reckwitz notes that (Reckwitz 2002, 250):

> "A 'practice' (Praktik) is a routinized type of behavior which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their us, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge. A practice [….] forms so to speak a 'block' whose existence necessarily depends on the existence and specific interconnectedness of these elements, and which cannot be reduced to any one of these single elements."

Alan Warde, who employs practice theory in the realm of consumption, helps further clarify the difference between practices and mere activities or actions. By stating that practices often require consumption Warde makes an important definitional distinction – practices entail consumption, but consumption is not a practice in and of itself (Warde 2005, 137). Consumption of a good or service is just one of the many elements that make up a practice. For example, the practice of commuting to work can entail the consumption of fuel, but it also requires several other actions, objects,

and knowledge. Commuting to work is then a practice, but the specific actions that go into commuting are simply that – actions.

For the purposes of this study, I regard 'the production of health services' as a practice and assess a variety of 'elements' that go into this practice. I particularly focus on actions related to the use of electricity, electric equipment and electric light as well as the influence of the health care system bureaucracy on the production and provision of health services. The 'elements' I consider include, in the words of Reckwitz, "forms of bodily activities, forms of mental activities, 'things' and their us, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge" (Reckwitz 2002, 250).

4.1.3 Contemporary practice theory

Though practice theory did not do away with the notion of structures, it did lead to a rethinking around the concept, notably by Anthony Giddens in the late 70s (Giddens 1979) and later by theorists such as William H. Sewell (Sewell 1992). The issue at hand was as Sewell notes (Ibid., 2):

> "What tends to get lost in the language of structure is the efficacy of human action – or 'agency,' to use the currently favored term. Structures tend to appear in social scientific discourse as impervious to human agency, to exist apart from, but nevertheless to determine the essential shape of, the strivings and motivated transactions that constitute the experienced surface of social life. A social science trapped in an unexamined metaphor of structure tends to reduce actors to cleverly programmed automatons."

Giddens's response to this problem – a heavy focus on the bounds prescribed by structures and an inadequate reckoning with agency – was the introduction of the concept of 'dual' structures. Giddens pointed out that structures "shape people's practices, but it is also people's practices that constitute (and reproduce) structures" (Sewell 1992, 4). He believed that though social structures influence actions, they do not necessarily lock groups into behaving in one socially accepted, expected or

imposed way. Humans have agency – the power to influence acts – that allows them to improvise and even act in opposition to social structures, and thereby eventually transform these structures and create new ones. In this sense, practice theory does not deny or minimize structures, "but expresses rather an urgent need to understand where 'the system' comes from – how it is produced and reproduced, and how it may have changed in the past or be changed in the future" (Ortner 1984, 146).

Sewell later elaborated on Gidden's ideas on agency stating that structures influence the type and extent of agency people have. Different people have varying levels of 'control of social relations' and 'transformative powers' (Sewell 1992, 20). He notes that, "[w]hat kinds of desires people can have, what intentions they form, and what sorts of creative transpositions they can carry out vary dramatically from one social world to another depending on the nature of the particular structures that inform those social worlds" (Ibid., 20-21). Our different perceptions of the social world and where we find ourselves in it – including our purpose, role, opportunities, limits – will enhance or restrict our transformative agency. Additionally, Sewell notes that resources are needed to carry out actions, and so an unequal distribution of resources among agents and social groups results in unequal opportunity for action as well (Ibid., 21).

Despite a diversity of ideas and a lack of consensus on the theory's every element, practice theorists were and are currently bound together by their quest to make sense of human agency and social change within the restrictions of norms, standards and institutions. "They all highlight the significance of shared or collective symbolic structures of knowledge in order to grasp both action and social order" (Reckwitz 2002). Or as Ortner states:

> "Each in its own way set out to conceptualize the *articulations* between the practices of social actors 'on the ground' and the big 'structures' and 'systems' that both constrain those practices and yet are ultimately susceptible to being transformed by them. They accomplished this by arguing, in different ways, for the *dialectical*, rather than *oppositional* relationship between the structural constraints of society and culture on the

one hand and the 'practices' – the new term was important – of social actors on the other" (Ortner 2006, 2).

In my own analysis I consider the various structures that constrain and facilitate the actions of employees at the Hospital, and thus the practice of delivering health services there. I assess the influencing forces of social norms and cultural values as well as the medical system bureaucracy and hierarchy on staffs' working conditions, including their access to resources (particularly electricity and electric equipment), their levels of skills and knowledge to utilize these resources, and their power to influence their own material working conditions and skills development. I also consider how staffs' workplace circumstances impact their agency and motivation.

4.1.4 Socio-material histories, habitus and the embodiment of knowledge

In addition to agency, another important contribution of practice theory was a new consideration of "socio-material histories" as a determinant of human actions (Wilhite 2013). Bourdieu believed that, "Moving and acting in sociomaterial space carves out predispositions for subsequent actions that are embedded in bodies, practices, and material settings" (Ibid., 62). In other words, our experiences from the past, including our interactions with things, people and social structures, will have influenced our dispositions, which in turn effect how we use things and behave in the social world. In this sense, practice approaches "tend to reduce the scope and ordering power of reason" (Schatzki 2001, 5) and turn attention to the development and stabilization of routines through time. For example, instead of always being thought-out and weighed, some human actions may be a mere result of observing, learning from and mirroring the actions of people in the same social group. Predispositions are thus important to understanding why human behavior and actions are not always rational, as commonly believed by original social theorists (see above).

Predispositions are also central to Bourdieu's concept of habitus, which relies on socialized norms and tendencies to explain behavior and thinking. Habitus is a "system of dispositions for thought and action that is constantly confronting and

mediating new experiences" (Sahakian and Wilhite 2014, 27). Experiences in the social world contribute to shaping embodied dispositions for future actions, actions that can turn into enduring behavioral patterns. In this process, conscious and reflective thinking, weighing of options, and rationalizing are replaced by habits and routines. However, habitus is also changing as it confronts and adjusts to new experiences over time. As Marlyne Sahakian and Harold Wilhite write:

> "This confrontation leads to a dialectical process in which experiences are absorbed into *habitus* and reform into dispositions for new actions,…...the habitus can structure – or organize practices and representations of practice – while also being structured by those very practices, in what is ultimately a dynamic relationship" (Ibid., 27).

Since predispositions play a central role in determining our actions and developing our habits, an important question becomes: how are these dispositions formed and embedded in us? Which elements of our socio-material histories influence their formation? In their writing about energy consumption, Sahakian and Wilhite argue that:

> "[T]he stubbornness of habits depends on how deeply anchored the habits are in relation to three pillars of practices: the body – including cognitive processes and physical dispositions; the material world – including technology and infrastructure; and the social world – including settings, norms, values and institutions. A change in any of these three pillars can shift a habit and indeed influence our overall dispositions. A change in more than one aspect would most likely lead to the dissolution of the habit" (Ibid., 28).

What Sahakian and Wilhite identifying are the ways in which our surroundings, including the physical and social world we are exposed to, contribute to the embedding of knowledge and consequently determine how we create and change our routines. To help understand this process they propose a framework anchored in practice theory that considers the body, the material world and the social world. For the sake of clarity, I will borrow similar but alternative terminology from Westskog and colleagues (who draw on Bourdieu 1988 and Sewell 1992) and refer to these

three elements as *human resources*, *non-human resources*, and *social norms and cultural values* (Westskog, Winther, and Strumse 2011). The 'non-human resources' category includes such things as natural resources and material objects as well as regulations and formalized procedures" (Ibid., 455). The 'human resources' category includes individual abilities including bodily strength, knowledge and skills (Ibid., 455). The final category consists of what I will call social norms and cultural values, for which I will use the same understanding as Westskog and colleagues – social norms are how social groups believe things should be and cultural values are what social groups value (Ibid., 455). Together these constitute "the ideas, values, norms, conventions and codes for human interaction that exist in any social group" (Ibid., 455). The type and amount of human and non-human resources people possess, as well as the bounds placed on them by social norms and cultural values, will influence the level of agency they have to act.

Non-human resources	**Human resources**	**Social norms and cultural values**
natural resources	bodily strength	ideas
material objects	physical abilities	values
finances	knowledge	conventions
regulations	skills	codes

FIGURE 4.1: The features of the practice theory framework I will base my analysis on with examples of elements within each category

Habitus and the embodiment of knowledge are important aspects of my analysis as I consider how staff carry out health care practices. I examine employees' previous experiences (in the social world and the health care sector) as well as their current situation and attempt to understand how the past and present have formed dispositions that determine actions and habits. I also consider how staff utilize the non-human and human resources at their disposal in their health care practices and reflect on the role of social norms and cultural values in forming these practices.

4.2 Technology script

When considering the agency of actors situated in a given social practice (e.g. production of health services), the 'script' of technologies is useful (a concept coined by Madeleine Akrich, see below). In this study on how people use electricity and electric equipment, it is necessary to assess not just how people's embedded knowledge influences the practice of providing health care services but also how context and the equipment being used influence the practice. "Individuals bring their knowledge and lived experiences to the interaction with things in practice, but the things they interact with can also influence the action" (Wilhite 2013, 64). The material context's ability to influence is what Sahakian and Wilhite call the "power of infrastructure and technology to act upon our actions" (Sahakian and Wilhite 2014, 29).

This power to influence, or agency, is central to Akrich's concept of technology 'script'. She argues that technologies are designed to be used in a specific way and for a specific purpose stating that, "like a film script, technical objects define a framework of action together with the actors and space in which they are supposed to act" (Akrich 1992, 208). During their design phase technologies are deliberately assigned a 'script' of which tasks they can and cannot carry out. Scripts are powerful because they, and the technologies they are inscribed in, can change or create new forms of practice. For example, cleaning practices around the world were altered with the introduction of washing machines and dishwashers. It should be noted, though, that this influencing power can be reciprocal – practices can also impact technology scripts, or how technology is used. Users can go outside the 'script' and repurpose technology, using it in ways it was not intended. One example is opening windows to alter temperatures in thermostatically controlled buildings. Technology users can even outright reject a script and use technology for an entirely different purpose than originally intended. As Akrich notes, designers will create scripts according to the presumed tastes, competences, motives, etc. of projected users, but only in the confrontation between the real user and the projected user will it become obvious what designers missed and if scripts will be accepted or rejected (Ibid., 210). In my analysis, I assess how the introduction of certain technologies and their scripts have impacted health care delivery practices at the Hospital. Furthermore, I consider

whether Hospital staff follow technology scripts or if they have altered them, and what consequences this has had on the health services produced.

4.3 Bourdieu's forms of capital

To help explain the distribution of human and non-human resources among Hospital staff I will draw on Bourdieu's notions on 'capital'. The basis for this concept is the belief that reality is not an "imaginary universe of perfect competition or perfect equality of opportunity, a world without inertia, without accumulation, without heredity or acquired properties, in which every moment is perfectly independent of the previous one" (Bourdieu 1986, 241). In other words, our divergent histories and backgrounds ascribe us unequal social statuses and starting points for achievement. Bourdieu identifies three forms of capital – economic, cultural and social – that all humans possess to varying degrees and that he believes determine people's position in society and thus their room to act. He notes, "the structure of the distribution of the different types and subtypes of capital at a given moment in time represents the immanent structure of the social world, i.e., the set of constraints, inscribed in the very reality of that world, which govern its functioning in a durable way, determining the chances of success for practice" (Ibid.).

The three forms of capital manifest themselves in different ways. *Economic capital* includes "economic possessions that increase an actor's capacities in society" (Siisiäinen 2000, 11). *Cultural capital* takes three forms: 1) the embedded state, which is "incorporated in the habitus and is to a large extent created through primary pedagogy"; 2) the objectified state, which includes all cultural goods; and 3) the institutionalized state, which is expressed in terms of certificates, diplomas and examinations (Ibid.). Finally, *social capital* is a product of "actors' connections and access to resources in the network or group of which they are members" (Lin 2001, 19). Affiliation with these groups "provides each of its members with the backing of the collectively owned capital, a 'credential' which entails them credit, in the various senses of the word (Bourdieu 1986, 21). In essence, all types of capital provide people with a form of credit or debit in the social world and can thereby determine

their agency and influence their practices. But, practices can also serve to signal capital, as in we choose actions that suit our position.

In my analysis of how actors utilize electricity, electric equipment and electric light while providing health services at work I consider the impetus and constraints placed on those actors by their position in the social world and more specifically the workplace social hierarchy. My analysis particularly focuses on two types of capital: cultural capital and social capital. For clarity purposes, I define cultural capital as leverage people have as a result of culturally valuable symbols they obtain or are bestowed. I particular consider the cultural capital provided by Hospital staffs' educational degrees and the role this capital plays in the distribution of human and non-human resources as well as agency to act at the Hospital. Additionally, my analysis considers social capital, which I define as leverage people have as a result of their social networks and connections. I look at the differences in 'credit' and room to act as expressed by men verses women, people in leadership verses non-leadership as well as rural workers verses urban. It is important to note that cultural capital and social capital in many cases overlap, and though I attempt to look at them distinctly, there will always be intersection between the two. Finally, my analysis considers the Hospital workers' degree of satisfaction in light of their levels of capital (economic, cultural and social).

5. A PRESENTATION OF THE HOSPITAL AND THE HEALTH CARE BUREAUCRACY

Below I begin to present the findings from my four-week field research. In this chapter I describe the management structure at the Hospital and explain how this structure operated. I then proceed to look at the government institutions that oversaw the Hospital and how they carried out their roles. Through my description I seek to highlight where authority was concentrated both in the Hospital and health system hierarchy. I conclude the chapter by describing general characteristics of Hospital staff, the particular challenges their characteristics presented and how the Hospital facilitated and restricted access to resources staff needed to perform their jobs.

5.1 Reporting lines and authority

To begin with it is useful to get an overview of the reporting lines at the Hospital.

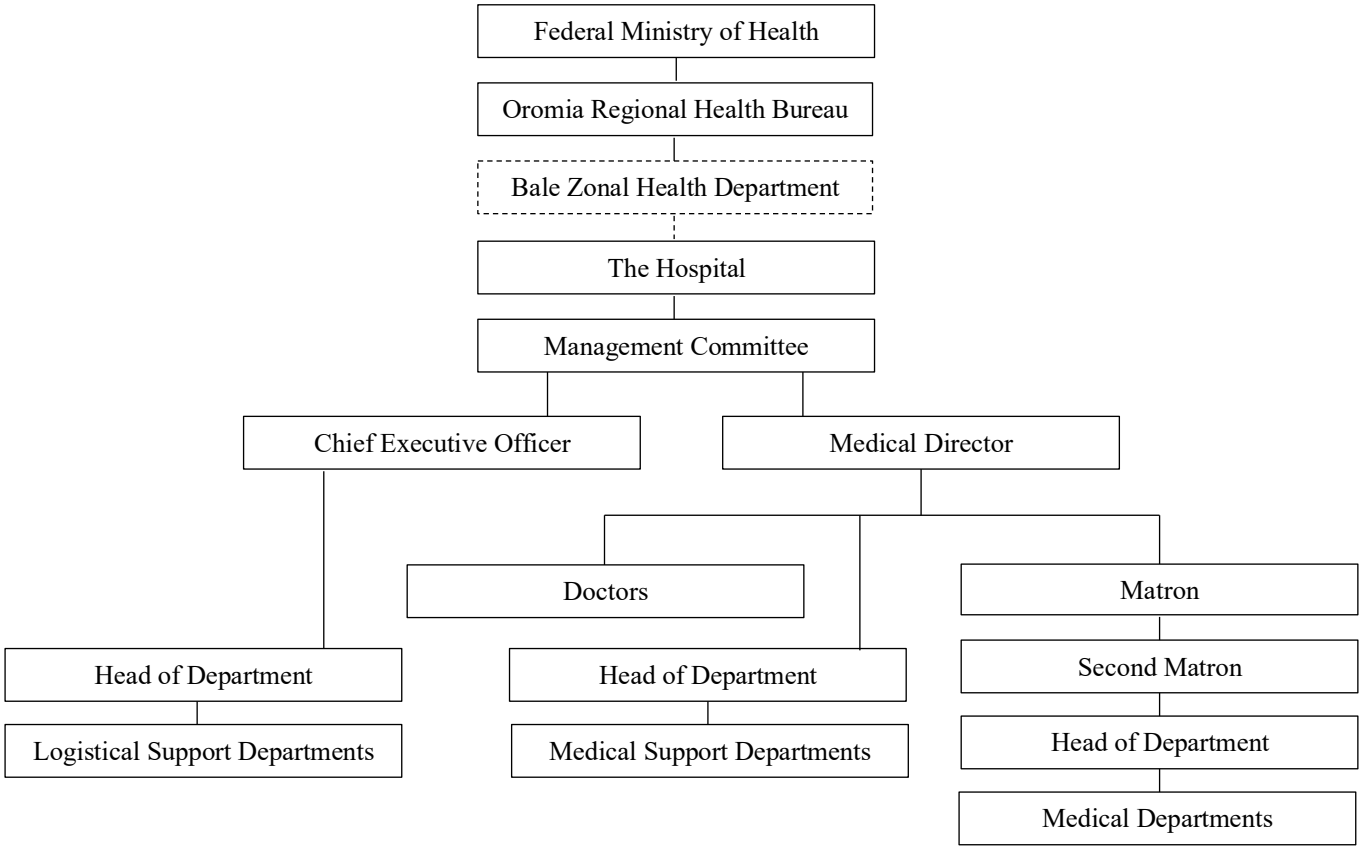


FIGURE 5.1: Reporting lines at the Hospital

The Hospital was headed by a Chief Executive Officer (CEO) and Medical Director (MD). The CEO held overall administrative and logistical responsibility, while the MD was the most senior medical authority at the Hospital. The two men in these positions were both new to their jobs. The CEO had served in his position for about three months, before which the CEO position was vacant for ten months. Similarly, the MD, a general practitioner physician (GP), was only promoted to this position about one month before my arrival. Prior to that he worked at the Hospital for five months purely in the capacity of physician. Besides his practical training during medical school, he had not held another job elsewhere before starting at the Hospital. Though it might be assumed that a specialized physician or at least a more senior one would hold the MD position, I was informed that it was in fact common for a fresh-from-school GP to have this role (05[6]). The Hospital's few senior doctors were busy attending to patients at the Hospital as well as at their private clinics in town. They did not have the capacity to take on the added responsibilities of the MD position. This meant that MDs at the Hospital were generally young and had limited experience. The current MD was in his late 20s.

The Hospital was divided into a number of departments, each with a designated department head. While the majority of the department heads were men, some of these positions were held by women. Departments that played logistical support roles and handled tasks traditionally assigned to women in the Ethiopian context, such as the kitchen, cleaning and laundry departments, were all headed by women. Of the 13 medical and medical support departments only four were headed by women. One of these women was on maternity leave during my research, so a male nurse was covering the position in her absence. Below is a list of all the departments at the Hospital with an indication of the gender of each department head.

[6] Refers to participant number 5 in the research. This form of referencing is used throughout the chapter to indicate the source of information provided.

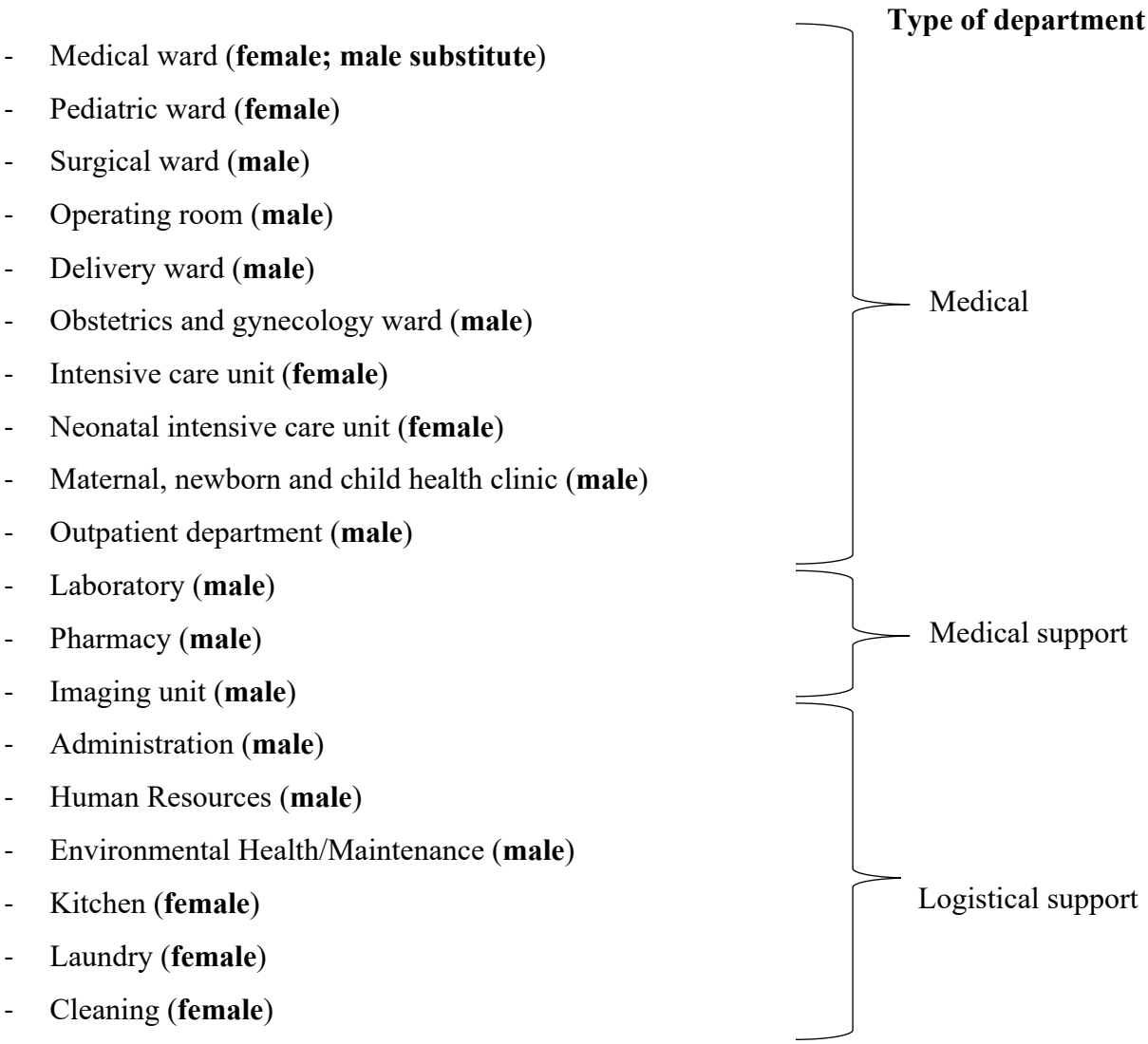


FIGURE 5.2: Departments at the Hospital with gender of department head indicated in parenthesis

Department heads had overall responsibility for such things as stocking supplies, overseeing the department's storeroom, making staff schedules, and overall oversight of patients and their records. For the medical departments, the department head positions were predominately held by a nurse or midwife. As is often the case in health facilities, a doctor provided medical supervision in the various medical departments. Doctors at the Hospital were differentiated into two groups – the GPs and the specialists. There were 11 GPs, all of which were men, and an additional three specialists, referred to as senior doctors. Two of the senior doctors were men while the third was a woman from aboard seconded to the Hospital by an NGO. These 14 doctors, among other things, led rounds with the nurses and midwives each

morning to assess patients and determine their various treatment needs for the day. A relatively new cadre of medical professionals in Ethiopia, emergency surgical officers trained at master's level, also stepped in to provide medical supervision when doctors were not available. There were two surgical officers at the Hospital, both of which were men. Major medical decisions were usually made by doctors or surgical officers, meaning mostly men. Midwives and nurses, professions that appeared to be near gender balanced at the Hospital, would then follow instructions from doctors and consult with them as needed (05).

The formal assignment of responsibility is one important aspect of the Hospital's management structure. The other is rank within the informal medical system hierarchy. As explained by one informant in the Hospital's leadership (02), doctors are more senior than nurses and midwifes in the health care system, which often meant that doctors by default took the leadership role and for all practical purposes were regarded as the departments' most senior person. Nurses and midwives, including those in department head positions, were expected to take a subordinate role and follow instructions, even if they had more experience in the health care field and at the Hospital. In Ethiopian society a 'doctor' title carries a lot of respect and authority (much more so than a nursing degree), and it is generally socially unacceptable to question people with medical credentials. Thus, this arrangement of not challenging doctors' authority and decisions was pervasive, not only at the Hospital but also throughout the Ethiopian health care system.

One of the expat workers at the Hospital (05) told me that to help her understand this hierarchy of authority when she first moved to Ethiopia, her colleagues told her about a running joke among students training to become health care professionals in the country. The joke is a scenario that takes place during final examinations. The students are presented with the question: what do you do if your supervising doctor makes a diagnosis and directs you to initiate a treatment that you are certain is incorrect? The only way to pass, the informant's colleagues told her with a bit of humor, is to answer that you would do as you are told. Another informant elaborated on this power dynamic between Ethiopian health care workers by stating that, "*Our problem is status and hierarchy*." He found it problematic for the country's health

care system that the status hierarchy is so important that no one, not even a department head, would dare to disagree with a doctor.

5.2 Management committee

Another important aspect of the Hospital's management structure was the Management Committee (MC). The MC was the highest decision-making body at the Hospital. It consisted of the following members indicated by gender:

- CEO (**male**)
- MD (**male**)
- Matron (**male**)
- Head of Pharmacy (**male**)
- Head of Laboratory (**male**)
- Head of Environmental Health (**male**)
- Head of Finance (**male**)
- Head of Human Resources (**male**)
- Head of Medical Supervision/Disciplinary Committee (**male**)
- Administrative staff responsible for Hospital reports to regional level (**male**)
- Administrative staff responsible for Hospital equipment (also appeared to serve a role as political representative) (**male**)

It should be noted that being a department head did not automatically ensure a spot on the management committee. For example, none of the female department heads were on the MC, nor was the female Second Matron. In fact, every member of the MC was male. When I pointed this out to members or previous members of the MC, their reaction was generally a mix of surprise over a reality they had not considered before and a bit of embracement (02, 17, 32). They responded that members of the MC were prescribed by national policy. I was told that according to the policy certain positions at the Hospital had to be represented on the committee, and the CEO could select two additional staff representatives at his discretion (02, 32).

According to informants (02, 32) the MC was responsible for making decisions that pertained to the daily running of the Hospital. It met regularly every Friday. The

committee's most important role seemed to be deciding how the Hospital's limited budget should be utilized. I was told that the MC decided on such things as new items to be purchased and repairs to be made (02). But there were limits. One informant on the committee (17) illustrated the problem using a hypothetical example that the Hospital needed an anesthesia machine. He pointed out that such a machine could cost a significant proportion of the Hospital's annual budget. After coving running costs there was never enough for large purchases like that. Such needs had to be elevated to a higher level in the health sector, to authorities with bigger budgets and access to global health donors. During my time at the Hospital I heard several informants express dissatisfaction and even frustration with the Hospital's leadership for not taking action to address resource gaps (06, 09, 16, 21, 23, 26, 27, 32).

The MC was also responsible for preparing and approving the Hospital's annual budget. The Hospital in principle operated with two budgets: one from funding allocated by the government and one from Hospital revenues. The Hospital had more flexibility in making the budget from revenues, but both budgets had to be reviewed and approved by higher governmental authorities. For the Ethiopian calendar year 2011 (2018 Gregorian calendar), the government budget was about 22 million Ethiopian birr (ETB), approximately 790,000 USD. The revenue budget was just under 6.9 million ETB, or about 245,000 USD. The Hospital's total budget in 2011, was thus approximately 1,035,000 USD for an estimated catchment area of over 1 million people. The figure below displays the major budget items as well as those noteworthy for this particular research project:

Budget item	Total budget in USD	Government budget in USD	Revenue budget in USD
Human resources	**613,258**	**612,029**	**1,228**
Materials and services	**406,927**	**166,864**	**240,063**
- **Disposable materials and supplies**	321,250	120,704	200,546
▪ Fuel and oil	20,770	10,119	10,652
- **Maintenance of property**	37,813	18,995	18,818
▪ Repair of machines/equipment	2,662	1,598	1,065
- **Contracted services**	27,658	16,723	10,936
▪ Electricity	3,551	3,018	533
Upgrading facilities and new equipment	**7,435**	**4,523**	**2,911**
Total budget	**1,030,563**	**786,360**	**244,203**

FIGURE 5.3: Simplified Hospital budget Ethiopian calendar year 2011 (2018 Gregorian calendar)

5.3 Beyond the Hospital – federal and regional authorities

The Federal Ministry of Health is the highest authority in the Ethiopian health care system. In other words, this was the top oversight level for the Hospital. However, there were other levels of institutional authority in-between that the Hospital interacted with and reported to regularly. Each of the nine regional states in Ethiopia has a regional health bureau responsible for health systems in their state. The Hospital was under the authority of the Oromia Regional Health Bureau (ORHB). Though health policy and guidelines are generally set at the federal level, the regional bureaus have quite a bit of autonomy in the running of their health systems. For example, one informant (02) said there were less favorable rules for work schedules and compensation of health workers in the Oromia Region than in the other regions, something he believed was hampering recruitment efforts in Oromia. When I asked informants where the Hospital turns with major problems, such as

equipment needs or repairs that could not be addressed with the annual budget, the response was always the regional body (ORHB). A senior figure at the Hospital explained (02):

> *"If we need equipment repairs, we can request a representative from the Oromia Regional Health Bureau to come. For example, the X-ray machine has been damaged for five to six months now. We sent a request for them to come repair it. Someone came about one month ago and stayed for two to three days working on it, but they were not successful. We have now sent a request to the Bureau for a replacement two times, but we have been told that X-ray machines are not available in Ethiopia now. They have promised that when they are, this hospital will be a priority. But I don't know if I believe this."*

Most large pieces of equipment at the Hospital, including those used in the operating room (OR), had either been delivered by the ORHB, a United Nations agency or an NGO. According to several informants (02, 05, 17, 20, 21, 24) responsibility for failures related to the supply and repair of equipment lay with the ORHB. The level of authority of the ORHB was also evident through the fact that it was the ORHB that was responsible for disbursing and approving the Hospital's annual budgets.

There were also implications for the Hospital and its management at the national level. For example, the Pharmaceuticals Fund and Supply Agency under the Federal Ministry of Health was responsible for stocking and distributing drugs and other pharmaceutical supplies throughout the country's public health care system. Several informants at the Hospital complained of stockouts (02, 05, 13, 17, 21, 32), including of essential antibiotics, reagents needed to run laboratory tests, and even medical gloves. One midwife (17) told of a period within the last few years when there was a near stockout of medical gloves in the whole country. According to informants (02, 13,17, 32) one of the major reasons for pharmaceutical stockouts was national import problems. Ethiopia struggles with a low supply of foreign currency due to its economic policies, something that hinders purchasing from abroad. A number of workers at the Hospital were confident this was the main problem. Thus, they

perceived the stockouts they experienced to be a result of national policies; poor management and unavailability of pharmaceuticals stemmed from the federal level.

5.4 Staff characteristics and degree of job satisfaction

An assessment of the general Hospital staff points to a few noteworthy characteristics. First, the Hospital staff was markedly young. Of the 22 people I interviewed, ten were less than 30 years old. In Ethiopia, students graduating from public medical and health sciences schools owe the government two years of service post-training. The Hospital was a typical place where such graduates are then sent because recruiting to such remote areas is otherwise difficult. The young age of so many workers was striking because it also reflected the low level of professional experience among much of the staff.

Another noteworthy point is that not a single person I spoke to expressed a sense of satisfaction with working at the Hospital and living in the town where the Hospital was located. The sentiments of one midwife was highly reflective of a general feeling at the Hospital (23):

> *"Being here is not OK. I requested to go to Bishoftu or Adama [more urban areas], but I got sent here. So now I have to be here for two years. But then I will go."*

There were complaints about few facilities and things to do in town, a lack of good schools for children, as well as the town's remote location and the long distance to the nearest cities. A few women complained of hostility and verbal abuse from the local population when they walked through town. These women (02, 07, 08, 09, 14, 23) said their trousers were disliked by locals who held conservative views on how women should act and dress. When asked about factors contributing to their dissatisfaction with working at the Hospital or living in the town where the Hospital is located, no one initially mentioned poor electricity conditions. Throughout my conversations, frustrations related to electricity eventually came to light following my prompting, but this did not appear to be the first problem on anyone's mind.

The pervasive belief among staff was that the rural town they lived in was boring, burdensome, old-fashioned and unsophisticated. Several informants spoke of their desire to obtain new jobs and move to more urban areas. Respondents appeared to regard 'the urban' as everything their current location was not – fun, easygoing, modern and sophisticated. It was a cultural symbol of contemporariness and refinement, while 'the rural' symbolized the opposite. Hospital workers seemed eager to distance themselves from the attributes they associated with rural populations.

Dissatisfaction and a desire to find work elsewhere were also fueled by other factors, among them low salaries. A number of informants (02, 09, 13) expressed frustration with what they perceived to be low compensation for the high performance expectations placed on them. One informant (13) even concluded that perhaps living in this town was his best option because the cost of living in more urban areas with a family was less sustainable on his government salary. Some informants (09, 14, 23) also felt the Hospital's leadership did not offer them enough training opportunities. Skills development was seen as important for professional development and mobility. But there was also another reason for dissatisfaction with a lack of training opportunities, as hinted at by one informant (12) – financial incentive in the form of per diems.

Nearly everyone I spoke to were eager to leave the Hospital as soon as they were released, as soon as they found a job in a less remote place, or as soon as they landed a job that paid better. Moving to a city, or at least making enough money to send and finance their families to live in a city, was most staffs' ultimate goal. However, jobs in cities were limited and popular, so competition for them was tough. Several informants (09, 14, 25, 26) had experienced that finding work in urban places was difficult. This meant a number of Hospital staff were 'stuck' in their job, despite an eager desire to be elsewhere. Though none of the staff I spoke with were pleased to be where they were, a few seemed intent on staying. These included a couple of older women who had established families there (06, 10), and another two men that had married local women, women who were tied to their families (08, 13).

As would be expected in a workplace where several staff were compulsorily sent and few wished to be, the turnover rate at the Hospital was high. This was particularly true for the doctors. The GPs at the Hospital were generally recent graduates sent there to serve their two years of compulsory time. The situation was different for the three senior physicians on staff. One was an international doctor seconded to the Hospital by an NGO. The other two were Ethiopians recruited through offers of attractive salaries, which I was told were significantly higher than the GPs' but necessary to attract needed talent (05). Additionally, these two senior physicians were allowed to, and did, run lucrative private health care businesses on the side. Their schedules were also much more flexible since less stringent rules applied to them regarding reporting for work and being present at the Hospital (05). With such favorable working conditions for senior doctors (at the Hospital and throughout the country), it is not surprising that GPs were eager to begin residency training to also become specialists. Many sought to start these training programs immediately after their two required years of service. I was informed that the Hospital was preparing to lose four of its 11 GPs in the coming months (02). But turnover was also a problem among management at the Hospital. Long-term staff told me the CEO and MD positions were regularly left vacant and in need of replacements. As mentioned earlier, the CEO and MD during my time at the Hospital had both only held their positions for a few months. Finally, because the Hospital was located in an undesirable, rural place it not only had a hard time retaining staff, it also had trouble recruiting.

5.5 Management challenges

The high worker dissatisfaction and turnover rate at the Hospital, in addition to recruitment difficulties, created some particular management challenges, for example staffing gaps. According to one member of management (02) a hospital such as this should have about 125 nurses on staff; the Hospital only had 48. Not only was getting enough staff a problem; equally challenging was recruiting people with the particular skills needed at the Hospital. There were certain positions and special competencies, such as a pediatrician, sorely needed that remained vacant. I was

informed that though this was largely a result of high turnover and low recruitment, budget constraints also played a significant part.

Twelve-hour shifts six days in a row were the norm at the Hospital. Some staff, particularly nurses, even worked a 12-hour day shift directly followed by a 12-hour night shift. One nurse (06) explained that this was her regular schedule from Sunday night through Friday. On Friday she worked a half day and had the weekend off, but on Sunday she would return to work for the night shift.

Another management challenge, related to high workplace turnover and employees' desire to leave, was a type of disengagement from responsibility among some staff. For example, a major problem at the Hospital was a high rate of equipment damage. There appeared to be several reasons for this (more on this below), but according to a member of the Hospital's leadership (17), one reason was staff members' unwillingness to properly care for and maintain the equipment. Two nurses had a similar explanation (06, 26). They pointed to the way employees were frequently rotated between departments to cover staffing gaps and believed this diminished incentive to preserve the equipment they used. Soon they would be rotated to another department anyway.

A similar mentality seemed probable among staff who believed they would soon find work elsewhere. In one ward, where the department head expressed an eagerness to find another job, much of the essential electrical equipment was not protected by voltage regulators, an important protective measure in that context. This was the case despite there being several new regulators available in the department's storage room. The department head even pointed to one voltage regulator on the floor and told me it was broken and needed to be fixed; however, from the looks of it this process was not underway. Furthermore, the department head showed me various equipment in the ward that looked poorly preserved and was not functional. The approach of this department head contrasted sharply with a staff member I met in the laboratory that had worked at the Hospital for seven years and was not actively seeking to leave. He took me through the laboratory and explained in detail all the systems and mechanism put in place to maintain as consistent of an electricity supply as possible and prevent electrical damage. There were uninterrupted power supply

(UPS) devices and voltage regulators, and separate routines posted on the wall for staff to follow when the small generator was running. During our 'inspection' we found one refrigerator that was not protected by a voltage regulator, and the next day the man tracked me down to inform me that he had fixed this.

5.6 Obtaining resources at the Hospital

When supplies and other resources were needed in the various departments at the Hospital, a request had to be made through a request form. Though the use of request forms was standard for all supplies, the people needed to sign off on the form and authorize such requests varied according to what was being requested. Requests for blood had to be signed by a doctor, the cadre of medical staff there were fewest of at the Hospital. In other words, there was a mechanism in place to ensure restricted use of blood. The Hospital's blood bank was located 125 km away on an unpaved, often difficult to pass road. Not only could it be difficult to pick up blood, but a low supply at the blood bank and limited availability of certain blood types were also continuous problems. One informant working in the Hospital's lab (where blood was stored) (13) estimated that the Hospital received only 5-10 blood bags each time a pick-up was made. The Hospital's ambulances were its only means of transportation, and thus ambulance drivers were responsible for blood pickups. According to someone in the Hospital's leadership (02), although they tried to go as often as possible (even once a day), there were often other matters the ambulance drivers had to attend to, such as transporting referral patients.

The Hospital's blood reserves a day I visited the laboratory.

One of the expat NGO workers at the Hospital (05) illustrated the Hospital's blood limitations through this example:

"We have a pregnant patient now with a huge growth inside her stomach next to her pregnant uterus. We cannot determine what the growth is until we operate. It's creating a lot of discomfort for the patient but is also potentially very dangerous to the mother and baby. In Western countries this would be considered an emergency and she would be operated on expeditiously. Here I wait to see what day her type of blood will be available. Given her condition she could potentially lose a lot of blood during the operation. It's too risky to operate when we don't have her blood type."

Requests for pharmaceutical supplies for the wards, which as pointed out earlier were often in short supply, had to be signed by the department head, meaning there was also some restrictive access-measures placed on these resources. On the other hand, requests for fuel to power the small generators, which some of the departments had, could be prepared by any member of the department. No restrictions applied. Fuel could be purchased in town. There were no travel limitations to limit access, nor had there been any fuel supply shortages in recent years. Not even budget constraints limited access to fuel, for as one member of the Hospital leadership pointed out (17), *"Electricity we must have, so if there is no budget left we take from somewhere else"*. It should be noted that my time of field research at the Hospital coincided with the start of the Ethiopian New Year (Sept 2011 Ethiopian calendar). With a new year comes a new budget, so financial constraints may not have been fully felt at this point. Responses related to the budget could have been affected by this circumstance.

6. ELECTRICITY AND ELECTRIC EQUIPMENT AT THE HOSPITAL: ACCESS, RELIABILITY AND UTILIZATION

In Chapter 5 I outlined my findings that related to health system bureaucracy and management of the Hospital. In this chapter I continue presenting my research findings but shift my focus to the three other factors my initial research question considers – electricity, electric equipment and electric light. In the initial section of the chapter I look at the electricity supply at the Hospital, including the reliability of grid electricity and back up sources, and try to determine electricity security by department. I also consider the ease with which backup electricity sources could be utilized by staff and document a number of challenges staff faced due to unreliable and missing electricity. In the next section I consider the electric equipment available to staff and how they used it as they delivered health care at the Hospital. I also consider restrictions on the utilization of equipment, including a lack of electricity and technical skills as well as equipment dysfunctionality. In the third section I present findings on the role electric light, as well as natural light, played in health care delivery at the Hospital. My findings on this particular topic include information on how staff viewed the lighting available at the Hospital, a reliance on sunlight that impacted patients' privacy, and safety concerns among staff working on a poorly lit Hospital compound. I conclude this chapter with a brief summary of how access to electricity, electric equipment and electric light impacted the actions of Hospital workers.

6.1 Electricity situation at the Hospital

According to one informant who had worked at the Hospital since its inauguration, during the first years of operation the Hospital's electricity supply came solely from a large diesel generator. At that time grid electricity had not reached the town in which the Hospital is located; this happened years later. At present the Hospital is connected to the public grid and thus receives a cheaper and steadier electricity supply. However, major problems persist. The electricity supply is unreliable. According to informants (05, 07, 09, 13) the electricity could disappear for a day or more at a time. Though one informant (09) said he had experienced the grid

electricity being gone for a whole week, most informants (05, 07, 13) said the longest electricity outages they had experienced were for three to four days. The longest outage I recorded during my four weeks at the Hospital was from 6:00 am (when I woke up so it could have been earlier) to 3:30 pm, a total of 9.5 hours. However, the most common type of outages were ones that lasted for minutes or hours at a time. During my time at the Hospital not a single day pasted without at least one electricity outage. These outages generally lasted for about 30 minutes to three hours but could occur multiple times a day with only a few minute or hour intervals.

Not only was the electricity supply at the Hospital unreliable, it was also unstable. Throughout my field stay I observed major voltage fluctuations, which were apparent through variations in the brightness of lighting. The lightbulbs in the home where I stayed could be brightly lit at one point and then dimly lit at another. One evening my hosts decided to shut off the grid electricity to prevent from damaging the electrical equipment in the house. An unusually bright lighting in the living room tipped them off that something was wrong. Using a voltmeter, they measured electricity above 300 volts. The following day my hosts' housekeeper, who lived close by, shared that a number of refrigerators in the neighboring houses had been damaged and were no longer functional.

6.1.1 Electricity availability by department

Patient meals being cooked over open fire

Almost all Hospital departments were connected to the grid, the exceptions being the Kitchen and Cleaning department, which received no form of electricity. In essence what this meant is that the kitchen staff cooked over open fires using firewood and coal. Despite cooking over fires, the kitchen was still in an enclosed space with poor ventilation. The smoke the kitchen workers were exposed to was evident from the thick layer of soot lining the walls. For the Hospital cleaners, a lack of electricity meant cleaning the Hospital without hot water.

The distribution of electricity by department appeared to be determined by a number of factors, including government policy priorities, the criticalness of care provided there and practicalities. For example, one informant was confident that the Delivery ward had a small generator because of the government's 'No mother should die giving birth' campaign (19). Poor maternal death statistics at the Hospital would lead to high levels of scrutiny from government oversight bodies. Similarly, the OR, ICU and NICU received the most critical patients, and so functioning medical equipment was essential there. The Kitchen and Cleaning departments, on the other hand, were neither policy priorities nor departments of immediate importance. Since I was never able to uncover why the Kitchen and Cleaning departments did not have electricity access, I have made an assumption that it is based on practical reasons. Both departments only functioned during daytime hours when sunlight was readily available. Firewood was a much more reliable source of heat for cooking than electricity and presumably also a more cost-effective option.

Soot on the walls in the kitchen

Still, even the departments that were connected to the grid did not have reliable electricity, as indicated above. To alleviate problems associated with this, the Hospital still had its original generator, which was now used only as a backup electricity source. This large generator was used as a full back up for the grid electricity; in other words, all the departments, including the lights and electrical equipment there, were connected to it. As with grid electricity, the Kitchen and Cleaning Department were the only departments not connected to the large generator. The limitation with this large generator was that it could only run for a certain amount of time before it would overheat and shut down. Consequently, accordingly to the two people responsible for maintaining and tuning it on and off (10,11), the large generator was always turned off after three to four hours of use. The other major challenge was the cost of running it. According to one informant (10) the generator required about 20 liters of diesel per hour. During my time at the

Hospital, diesel was selling locally for about 16 ETB, or 0.57 USD, per liter. The cost of running the large generator was thus approximately 11.40 USD per hour. This, I was informed, was substantially more than the cost of grid electricity (17), although I was unable to obtain a per hour cost to compare. The large generator was routinely run every day from 7 to 10 pm, when the grid electricity was out within that timeframe. I inferred that this was primarily due to lighting needs during those hours and that activity levels at the Hospital could still be quite high then. If circumstances required, the large generator could also be turned on sporadically throughout the day.

A few departments also had their own small generator. Since the large generator could not be run consistently during long electricity outages, the department with the most essential electricity needs had been allocated additional small backup generators. These departments included the OR, Delivery ward and Laboratory. The ICU and NICU jointly shared two small generators, one as a backup for the other. The pharmacy store also had a small generator, but it was not functional during my time at the Hospital. When the grid electricity disappeared, I observed that the small generators were usually turned on first, before the large one. According to informants (10, 17, 32) they were more cost efficient for the Hospital plus there was a shorter delay between turning them on compared to the large generator. Though no one said they had been instructed to use the small generators over the large one, this was clearly how departments operated.

But the small generators had limitations too. They would also overheat after about three hours, before which they would need to be turned off. The challenges with this became particularly evident in my observations. In the NICU one day as the nurses panicked and called frantically around for help because the small generator currently running was about to overheat and shut off, and the other small backup generator had become damaged and was nonfunctional. There were three premature babies hooked up to essential medical equipment in the NICU; everything would turn off when the generator shut down. At the very last minute a member of the Hospital's leadership came running with another small generator, which he managed to hook up just in time. He had barrowed it from the Delivery ward, which was then left without one.

Another challenge with the small generators was that they could not electrify all essential equipment due to lesser wattage. Practically none of the equipment in the OR could be run on the small generator, including the large surgical lamps, the autoclaves (sterilization machines) and the anesthesia machine (05, 21, 25). While running the small generator staff in the OR had to improvise with flashlights and manual oxygen pumps (05, 21, 25). The NICU faced similar limitations. Since the newborn incubators could not run on the small generators, all babies were moved under a single heat lamp (the same type used for raising pigs, I was informed) when the small generator was running.

OR with surgical lamps (overhead) and green anesthesia machine that could not run on the small generator.

NICU where premature babies were placed under a basic heat lamp while the small generator ran.

The Hospital relied heavily on diesel-run generators as backup electricity sources. Solar options were much less utilized. I was informed that years ago an NGO donated one solar panel lighting kit each to the ICU and NICU (09). This had resulted in a dual backup electricity system in these two units – the small generators were used to electrify equipment; the solar systems were used to provide light.

Department	Grid	Large generator	Small generator	Solar
Medical ward	X	X		
Pediatric ward	X	X		
Surgical ward	X	X		
Operating room (OR)	X	X	X	
Delivery ward	X	X	X	
Obstetrics and gynecology ward	X	X		
Intensive care unit (ICU)	X	X	X	X
Neonatal intensive care unit (NICU)	X	X	X	X
Maternal, newborn and child health clinic (MNCH clinic)	X	X		
Outpatient department (OPD)	X	X		
Laboratory	X	X	X	
Pharmacy	X	X		
Imaging unit	X	X		
Administration	X	X		
Human Resources	X	X		
Environmental Health/Maintenance	X	X		
Kitchen				
Laundry	X	X		
Cleaning				
Cafeteria	X	X		
Staff housing on compound	X	X		

FIGURE 6.1: Electricity availability by department and source

6.1.2 Turning on backup electricity sources

None of the Hospital's generators turned on automatically when the grid electricity disappeared. They all had to be turned on manually, which meant responsibility and authority to do so was with staff. Though no one could provide comparative figures, several informants (both within the leadership and not) mentioned the higher cost of

running generators, especially the large one, over grid electricity. Yet, the Hospital had very few restrictions, if any, on who could turn them on and under what circumstances.

There were two people responsible for the large generator. Their responsibilities included turning on the generator as requested, monitoring it for overheating, changing the oil as needed, and refueling it (10, 11). They were also trained and expected to make small repairs. Only these two responsible people had keys to the room in the back of the compound where the large generator was housed. One of the two had to be present at the Hospital at all times, and both had housing on the Hospital compound. One of the two, a man, had primary responsibility. The other, a woman, served as a backup. The woman had up until the last three months been the main responsible person, but due to the demands of the job, including often having to turn the generator on and off in the middle of the night, she was happy to have been assigned other primary responsibilities at the Hospital (10).

I was frequently told that "anyone" could call the two people responsible for the large generator and request them to turn it on. Such requests did not need any senior approval. One midwife, two nurses and a GP (09, 14, 25, 32) told me they did this whenever they needed to, that its use was not limited to particular situations, and that their requests had never been denied. Two other midwives (07, 08) claimed the large generator would only be turned on under special circumstances, like if the autoclave or anesthesia machine in the OR needed to be run. According to my observations, this was the most accurate explanation – the large generator was mostly turned on in emergencies when large equipment was being used in the OR. But still, few mechanisms appeared to be in place to control use of the large generator. When asked how this system, with so few restrictions, could work with a limited fuel budget, the woman responsible for the large generator (10) said she believed the fuel budget was probably exceeded every year, but that money was then taken from other budget items because electricity was so essential.

While getting requests to turn on the big generator approved was not much of a challenge, I was informed that getting it turned on quickly could be (21, 25). The responsible person first had to be reached. This could be problematic when the

mobile network was poor or fully down, something that was not uncommon and often corresponded with electricity outages (05). During my time at the Hospital I experienced at least five days with periods of 'no network'. In those cases, the responsible person had to be physically located. Next, that person had to reach the generator at the back of the Hospital compound and turn it on. This total process took time, and time was critical in the Hospital setting. Staff in the OR (05, 21, 25) informed me that while they waited for the big generator to be turned on they had to take turns manually pumping oxygen (bagging) for patients under anesthesia. Sometimes they would have to assess whether it was worth requesting for the large generator to be turned on and wait for this, or if they should simply continue with improvised lighting, equipment and techniques (05).

The more time-efficient back-up electricity option was the smaller generators that some of the departments had. Where there were small generators, I was told any staff member in those departments was authorized to turn them on. Again, no permission had to be sought from a senior person. Furthermore, there was less of a delay because the generators where located right outside the given building and staff could simply walk outside to turn them on, some with a key (stored in the corresponding ward and available to all staff) and some by manually pulling a cord. The generators had all been key-based at some point, but the keyholes on the older ones were no longer functional. Thus, these had to be started using manual force instead.

While authorization and access did not appear to be barriers to staff using the small generators, the ease with which they could be turned on was. As mentioned, some of the small generators could be turned on with a key, but others, specifically the one for the delivery ward and OR, had to be turned on using physical force to pull a cord. The key-started generators could easily be turned on by everyone, but some informants (07, 08, 25) saw the manually-started ones as a particular obstacle for women. In the delivery ward two male midwives (07, 08) indicated that women were unable to turn on the small generator due to the physical strength required. However, eventually they conceded that not only the women had trouble, three or four of the men in the ten-person ward were also unable to do so. Still, a female nurse, also from the Delivery ward (14), seemed to agree with the male nurse's assessment of the gendered divide between who could turn on the small generator. She simply laughed

when I asked if she could do it and went on to say, "*This is a job for the men*." When she needed to turn the small generator on, she sought help from male colleagues. A male nurse in the OR (25) shared a similar observation, that the physical force required to turn the small generator on was a particular challenge for female staff. He noted that during operations there was always one surgeon, one anesthesia nurse, one scrub nurse and one "runner" nurse present in the OR. The only person who could leave the room during an operation was the runner, which meant if the electricity disappeared during that time, this person had to turn on the small generator. The informant pointed out that female runner nurses could face challenges in this regard and had to seek out staff in other departments for assistance. Finding assistance during night hours could be particularly challenging because the staff size was much reduced during that time (07).

However, other staff, including both women and men, dismissed the idea that there was any difference between men's and women's ability to turn on the small manually-started generators. A female nurse (27), who once worked in the OR but had now been rotated to a different department, huffed at the idea. "*What? I did it every time!"* she exclaimed with a sense of annoyance. Another male midwife (17) told me, with both a sense of humor and seriousness, that he always went to a specific female nurse when he had difficulty turning the generators on. She was "*perfect*" at it, he explained. This female nurse (26) later verify that she had in fact become quite skilled at turning on these generators. To further demonstrate her ease with them she informed me that she even changed the oil herself, despite there being a designated maintenance person for this. Another female nurse (23) made a similar statement when asked about the gendered use of small generators – *"I check the diesel levels. I switch to generator [mode]. I turn the generator on. I look for the warning [overheating]. I turn it off. I do it all!"*

6.1.3 Challenges with unreliable and reduced electricity

It has already been mentioned that staff in the OR faced acute problems when the electricity disappeared. When the anesthesia machine cut out, oxygen had to be pumped manually for patients. I also heard of instances where poor lighting made it

difficult for staff to see, for example making it impossible to locate the source of uncontrolled bleeding during surgery (05). Staff in the NICU and ICU faced similar challenges. When the electricity disappeared, so did essential oxygen for critical patients hooked up to oxygen concentrators. Though these oxygen concentrators could be run on the small generators, there was always a small delay before they were turned on (09). As mentioned before, the newborn incubators could not be used on the small generator, so all the babies were moved under a heat lamp when the small generator was run. While this was helpful in regulating body temperature, it did little to protect the premature babies from infection or allergens.

Other departments faced challenges too. The laboratory did not have the equipment or capacity to properly store human specimens for long, so several diagnostic analyses had to be run fairly quickly. This was difficult without electricity, so the small backup generator was essential for this reason (13). I was informed that when the electricity disappeared in the laboratory, patients' samples could be destroyed in some of the diagnostic equipment that shut down (13). New samples would then need to be collected. Another problem in the laboratory was properly refrigerated storage of blood reserves. The Hospital's large generator was mainly run during the standard evening hours or when surgeries or other emergencies required it. The laboratory's small generator was only run when patients needed laboratory services. This meant neither of the generators were run much during night hours. One staff member (13) explained that when no generators were running, laboratory staff had to regularly monitor the refrigerator temperature to ensure it did not rise above six degrees Celsius. The same informant went on to say that this could be problematic during the night, because staff would often sleep when there were no patients to tend to. If the temperature rose too high, the blood could potentially be damaged and might need to be discarded. This could be a consequential loss, given the Hospital already had a hard time maintaining an adequate blood supply.

Refrigerated pharmaceuticals

Proper storage of pharmaceuticals was another challenge at the Hospital. The pharmacy had one functional refrigerator in the dispensary and several others in a separate storage space. The dispensary did not have a small generator; the pharmacy store did but it was not functional at the time of my research. I was shown numerous pharmaceuticals in these refrigerators, including, as seen in the pictures, insulin, oxytocin and various vaccinations. Since these refrigerators relied exclusively on grid electricity and the big generator, there could be significant periods of time without any electricity cooling them. I was informed that, when necessary, drugs would be moved from the refrigerators to small ice chests and stored with cooling elements (02). Yet, several of the cooling elements I observed in the laboratory storage area were not frozen at the time and thus not ready to be used for this purpose. I was told that there had recently been a change in person responsible for the pharmacy storage, and that such a lapse could be due to this (02).

Ice chests used to store pharmaceuticals during long periods of interrupter electricity.

Cooling elements used in the ice chests laying outside the pharmaceutical store unfrozen.

The ICU also experienced a particular challenge that resulted from unreliable electricity – overcrowding. The ICU and NICU were the most 'electricity-secure' places in the Hospital with two small backup generators. Only premature newborns were allowed in the NICU, which meant all other critical patients, including pediatric patients, were placed in the approximately six by six square meter, five-bed ICU room. But as a couple of informants pointed out (02, 05) it was not only critical patients that ended up in the ICU. The example of asthma patients was used to demonstrate the problem – all such patients required was supplementary oxygen from an oxygen concentrator but no further critical care. However, since continuity of oxygen from a concentrator could best be secured in the ICU with its two generators, this is where such patients got placed (05). Another informant (09) noted the high number of child malnutrition cases at the Hospital and how many of these child-patients ended up in the ICU because of oxygen needs. He said it was not uncommon for up to three children to share one bed. The same informant explained that when the ICU was at capacity, mattresses were brought in and put on the floor for new patients. The problem with sending patients that were not 'critical' to the ICU went beyond space; it was pointed out that this also stretched the capacity of nurses in the ICU and made it hard for them to focus on the patients that actually did require intensive care (05, 09). As one ICU nurse stated (09), "*This is the most challenging area to work in this hospital*."

A bit surprisingly, being stationed in wards that did not have a small backup generator seemed preferable among some staff. A midwife in the Ob/Gyn ward (14) explained that she preferred working there over the Delivery ward, because when the electricity disappeared, there was not much she could do – her work load was lessened. Particularly during the nightshift, she preferred it this way, because she was more likely to get some rest working in the Ob/Gyn ward. In the Delivery ward, on the other hand, a small generator allowed activities to continue as normal. When working there she more rarely had breaks and was thus more often left feeling tired or even exhausted.

6.2 Electric equipment at the Hospital

Frustration with patient-capacity limitations were expressed by staff in the ICU, NICU and the OR (05, 09, 23, 25). However, each of these informants pointed out that it was not necessarily a lack of space that was the issue but rather a lack of medical equipment, particularly expensive electric equipment. In the NICU it was noted that more space was needed to better separate and prevent the spread of infections to vulnerable babies, but additional equipment, such as neonatal tables and incubators, was the restricting factor (23). Similarly, the Hospital had three ORs, but only one was in use because the other two were not adequately equipped (05, 25). The two unused rooms lacked such basics as operating tables. One informant (05) pointed out that if a surgery was ongoing and another emergency surgery was required at the same time, waiting was the only option.

Other equipment limitations had even bigger implications. The lack of a functional X-ray machine, for example, meant surgeries had to proceed without images of patients' internal injuries or conditions. Surgeons instead had to rely on simple clinical examinations to assess the patient and take a best guess (24). This was particularly problematic for abdominal and orthopedic (trauma) surgery. The lack of an X-ray machine meant it was too risky to operate on the most critical patients, so they were instead transferred to another hospital.

As mentioned in the budget section above, the Hospital was not in a financial position to address its medical equipment needs, or at least not larger items. Instead, such things had to be provided by government authorities overseeing the Hospital or donors, including multinational organizations and NGOs. This appeared to have created a situation where the Hospital and its departments received equipment sporadically, but what they received was not necessarily the things they most needed. A number of informants (09, 21, 25) said that there were no routine planning processes, such as when annual budgets were prepared, during which departments could make equipment requests to the Hospital's leadership. Rather, this was done on an ad hoc basic. Still, even when requests were made, they were rarely fulfilled (09, 21, 23, 25). This was confirmed by a member of the Hospital's leadership (17) who said budget constraints made it impossible to meet all the Hospital's equipment

needs. If the ORHB or a donor could not provide it, there was no way to obtain it (17).

Similarly, according to another member of the leadership (02), the ORHB never asked the Hospital what its needs were. Despite this, the Hospital frequently sent specific requests to the ORHB, but again, these specific requests were rarely granted (02). The example of the much-needed, new X-ray machine mentioned above is one example. Instead, I was informed that the ORHB at times delivered equipment that was never requested and perhaps not even needed (17). Such equipment could end up in storage, like a brand-new anesthesia machine I observed in a storage room. The machine could not be used to make a second operating room functional since the Hospital was still missing additional operating tables. Nonessential, donated equipment was also placed throughout the Hospital departments and not used, like the patient monitoring machines that were delivered to the ICU months before my arrival but were still wrapped in plastic. However, the ultimate example of unusable equipment were the two large autoclaves delivered by the ORHB years before that currently stood unused in the OR sterilization room. The machines' large electricity requirements were not compatible with the Hospital's current electricity setup and transformer, and so the machines could not be utilized. According to informants (17, 21) equipment was often donated to the ORHB randomly by multinational organizations or NGOs and then distributed among health facilities. Other equipment at the Hospital had been donated by NGOs that ran projects and seconded staff there.

Interestingly, though there were complaints about inadequate electric equipment, there were also instances of staff preferring non-electric equipment to electric equipment. The most commonly mentioned example of this was oxygen cylinders preferred over electric oxygen concentrators. With oxygen cylinders electricity outages were not a concern (02, 21). Furthermore, according to informants, the oxygen saturation provided by oxygen concentrators was significantly lower than that provided by oxygen cylinders (02, 09, 23). One informant (05) even went so far as to call the oxygen provided by concentrators "*a joke*". In the NICU the nurses had made makeshift pumps out of water bottles to increase the intensity of oxygen from the oxygen concentrators (*see photo*). The NICU nurses I spoke with (16, 23) said patients would be much better off with oxygen from cylinders. A similar assertion

was made by a nurse in the ICU (09). However, nurses in both units said they rarely had access to filled cylinders. The Hospital had only a limited number of cylinders because they were expensive, and they were only refilled sporadically because the refill station was in the capital city over 500 km away (02). The OR received first priority, but even there keeping oxygen in stock was a problem (05, 21, 25). One staff member (25) said the OR could go up to two months without it. The two cylinders I observed in the OR during my stay were empty, but I was informed a few days before my departure that they had been refilled.

An oxygen concentrator and empty oxygen cylinder in the NICU.

A handmade pump to intensify the oxygen concentrators in the NICU.

6.2.1 Usefulness of equipment

It was not only electricity outages and low wattage from generators that made some medical equipment nonoperational. Some equipment at the Hospital was only minimally useful because staff were not fully trained to use it. In the Ethiopian health-education system nursing specializations are still a new and upcoming concept. Anesthesia nursing has become a relatively well-established training program in the country, but programs for example in OR, neonatal or ICU nursing are either not yet established or still in the early stages of development. This means the large majority of nurses in Ethiopia are not specialized and have never received specific training in any of the procedures or equipment particular to their department.

This capacity is developed at work or through short-term training opportunities after they are hired.

The consequences of this were evident throughout the Hospital. In the NICU there were four nurses, three of them had received some form of additional NICU training. One was a neonatal nurse with two years of specialized training from a national pilot training program. The other two had at some point undergone a six-week training course. The final nurse was recently transferred into the NICU and admittedly knew little about how to use the equipment there (16). Though the other three nurses tried to help her learn, they acknowledged that they were not fully up for the task as they themselves were not completely proficient (16, 23). They were only familiar with basic functions and did not understand several of the equipment's settings. If the machines behaved in unexpected ways, they admittedly would not know what to do (23, 27).

When asked about the electronic fetal monitors (also known as cardiotocographs) in the Delivery ward, a number of midwives (07, 08, 14) said they were able to use them just fine. However, a senior doctor (05) told me the amount of information midwives were able to read and decipher from the machines was limited. This doctor concluded that few midwives were able to make comprehensive assessments about infants' and mothers' wellbeing based on data from the machines. Midwives relied on the machines to notify them of emergencies, but limited machine proficiency prevented them from identifying certain precursors to emergency situations and thereby also from averting them. According to midwife informants (07, 08) learning to use electric fetal monitors was not a part of their midwifery training curriculum. The electronic fetal monitors at the Hospital were donated by an NGO about three years before my research (05). At the time a midwife seconded by the NGO worked in the Hospital's Delivery ward and conducted some training with the staff. Though I was unable to figure out the exact number of new midwives in the Delivery ward since that time, given the high turnover rate at the Hospital, it was not unthinkable that a significant number of staff in this ward were new and had not received training in using the machine. Another expatriate staff currently seconded to the Hospital (12) once asked me the rhetorical question: might simple, manual equipment, such as a stethoscope to listen to a baby's heartbeat (Pinard horn), which midwives are taught

to use during their training, be more appropriate in a context like this? The informant was concerned the electronic fetal monitors had created a false sense of security that discouraged staff from manually checking vital signs and following up patients as they had been trained to do. The informant clearly disagreed with the decision to equip the Delivery ward with such machines.

The same senior doctor as mentioned above (05) provided another example of problems that resulted from staff having access to equipment they were unprepared to properly utilize. As an obstetrician and gynecologist, this doctor's work relied heavily on an ultrasound machine. Only two of the specialized senior doctors and a radiologic technologist at the Hospital were trained to use such machines. GP doctors in Ethiopia are not trained to use them, nor are midwives or nurses. The informant explained that at one point she made an effort to train a few medical officer colleagues to understand the basics of the machine and what the images revealed. However, shortly after starting the training it occurred to the doctor that these health officers had begun performing ultrasound scans independently and diagnosing patients incorrectly. After this, the doctor started restricting others' access to the machine by locking it in an office.

One of the expatriates at the Hospital (05) noted a factor that exacerbated this issue of inexperience and inadequate training related to use of equipment (as well as an obstacle to improving overall patient care) – the strong prevalence of pride in Ethiopian society. This, my informant said, meant Hospital staff were quick to distance themselves from mistakes and instead quickly assigned blame to others. Furthermore, it meant that staff became highly offended if their faults were pointed out, an act that could destroy personal and working relationships. During my time at the Hospital I was told of a couple of instances from the past when pride had consequential implications. One story involved critique and blame being assigned to a staff member for failing to report to the Hospital when he was on-call and there was a critical patient that needed his attention (05). Subsequently, the staff member on the receiving end of this critique became highly offended by the humiliation he was subjected to and deliberately became uncooperative afterwards to demonstrate his disgruntlement. Though my informant acknowledged the failing of this staff member, she also recognized that by assigning all blame to him, the staff members

who had been on duty at the time of the incident were completely removing responsibility from themselves (05). The same informant told me of another incident when a senior staff member pointed out the mistakes of a more junior staff member that had improperly handled surgical tools in the OR. The junior staff had left tools, including a used needle, lying around haphazardly in a way that led another staff member to prick herself, stocking fears that she could have contracted a serious infection. When this mistake was subsequently pointed out, a similar reaction occurred – the junior staff member became angry and uncooperative. In both of these instances, staff were unwilling to acknowledge an opportunity or need to learn from the situation; it was all about protecting one's pride.

6.2.2 Equipment damage – a persistent problem

Improper use of electric medical equipment could lead to suboptimal outcomes for patients, but it could also damage that equipment, which was a concern expressed by some of the informants I spoke with (05, 17, 21). Throughout my stay I was struck by all the nonfunctional equipment lying around the Hospital. Storage rooms were full of damaged oxygen concentrators and autoclaves, numerous refrigerators that no longer worked were left outside behind buildings, and there were even two storage areas dubbed the 'equipment graveyards'. Several damaged voltage regulators could also be found throughout the Hospital.

Nonfunctional equipment, including a refrigerator, stored in the 'equipment graveyard' in the back of the Hospital compound.

The Hospital's other 'equipment graveyard'.

While improper use of equipment might have been one explanation for this situation, inadequate handling and maintenance may have been another. In the OR an informant (25) showed me the operating table and explained that the height of the table was once electrically adjustable. This helped facilitate the movement of patients on and off the table and allowed those performing operations to set an individual optimal table height. However, the informant explained that, despite it not being in use for more than four months, the table's electric functions no longer worked. This created challenges, as another informant (05) illustrated using the example of performing cesarean sections. The informant was quite small in size and explained that lifting babies out of mothers' stomachs was difficult when the table was permanently set so high. Two staff members (21, 25) in the OR theorized that the table became damaged as a result of too much blood running into the electrical system. They believed the table was not cleaned properly post-surgeries. Either way, to overcome this challenge the informant had started using a simple stepping stool when performing surgeries. Other equipment in the OR that was not functional included a cautery machine, which is a surgical device that, among other things, burns the ends of cut blood vessels to stop bleeding during surgery. I was informed that health workers were now instead manually tying blood vessels as a result of the dysfunctional cautery machine (05). The emergency backup battery on the anesthesia machine and several autoclaves in the OR were also not functional. Specifically, the autoclave that sterilized clothes was damaged, so an alternative autoclave that was not designed for clothes had to be used instead. Consequently, the OR staff wore surgical clothes covered in holes because they became damaged in the sterilization process.

Beliefs that staff were not properly caring for equipment were not uncommon. A member of the Hospital's leadership who had worked there for years (17) said, "*Handling of equipment is a problem. It is often not cleaned or stored properly*." Another senior informant (21) pointed to a general lack of understanding around maintenance and stated, "*The equipment gets damaged because of a knowledge gap. Staff do not know how to take care of and maintain the equipment*." Despite having more years of education and experience than most of his colleagues, this informant conceded that even he did not know how to properly care for things. No one was trained to do this. The same informant also mentioned a problem already highlighted

by other informants above, namely that staff did not take responsibility for the equipment or learning to care for it. However, there were also other theories about why equipment frequently became damaged. The extreme voltage fluctuations in the Hospital's electricity supply was identified by some informants (06, 09, 13, 26) as a contributing factor, particular in the case of refrigerators and autoclaves. The number of blown-out voltage regulators I observed throughout the Hospital were an indication of how strong these fluctuations could be. I asked one of the staff in the Delivery ward (25) if he ever monitored the intensity of the light to determine if the electric voltage was either too higher or too low, but he responded that he did not. He said that even if he did this, how would it help? While some complained that regulators were not readily available at the Hospital, others claimed there were several in storage. I myself observed a number of new voltage regulators in at least two storage rooms at the Hospital. Another theory on why equipment became damaged was that it was of poor quality to begin with. As one informant stated (32), "*We always go for the cheapest option instead of the best one*." He believed overuse was destroying the low-quality equipment.

A lack of consensus among staff on the reason why equipment became nonfunctional was perhaps the most evident when I asked about damage to oxygen concentrators. Two informants (06, 26) believed the reason these particular machines so easily became damaged was because voltage regulators were not available or simply not used. Another informant (09) blamed poor air circulation in the rooms where the oxygen concentrators were used. He believed bad air quality caused by patient- and visitor-overcrowding and poor room ventilation meant the machines were taking in bad air, which in turn was clogging them. Two other informants (12, 23) believed damage was a result of poor-quality water used in the machines. They pointed out that oxygen concentrators need water to run, and this water should be distilled. Since the Hospital's water distillation machine was nonfunctional and distilled water was thus not available, oxygen concentrators were run on bottled water instead. Bottled water contains minerals that the informants believed were creating buildup inside the machines and thereby caused them to eventually become dysfunctional. In this sense there was consensus, at least, on the fact that improper and irregular cleaning of buildup was a major contributor (09, 12, 17, 23).

On the other hand, one thing there was general agreement on among informants was a lack of competency to repair damaged equipment at the Hospital. According to informants (07, 08) government policy prescribed that all Ethiopian hospitals should have a biomedical engineer on staff. When I first arrived for my research, I was informed that the Hospital's biomedical engineer had recently left, and so there was currently nobody in this role. By the time I was preparing to leave I heard a new person had just been hired. From what I understood, biomedical engineering was a relatively new study program in Ethiopia and multiple staff (07, 08, 12, 13, 17, 21, 25, 32) expressed concern about the quality of training this cadre of engineers received. If equipment broke informants conveyed little faith that a biomedical engineer could fix it. Several based their assessment on experience – a Hospital biomedical engineer had attempted to repair the X-ray machine, the cautery machine in the OR, and several autoclaves without success in the past (02, 21, 25). Several staff members told me they had now stopped contacting the biomedical engineer when equipment broke. Interestingly, a number of informants (02, 06, 13, 26, 32) mentioned that one of the Hospital's ambulance drivers was a skilled electrician capable of making various electrical repairs. A few even expressed admiration for what he had been able to repair in the past. One informant (32) said that at another time when the X-ray machine was damaged, several people, including one sent by the ORHB, had tried to fix it, but only the driver was eventually successful. Another informant (26) praised the driver for once being able to fix an autoclave in the OR, a piece of equipment that was notoriously hard to repair. According to one informant (05) the driver had received electrical training while serving in one of Ethiopia's past wars. Though he had held the position of 'informal electrician' at the Hospital in the past, informants explained that he was now employed as a driver and was often too busy traveling to handle repairs. "*He is our handyman, but he doesn't have electrician-training papers, so the system does not allow for him to be in this position,*" explained one informant with annoyance.

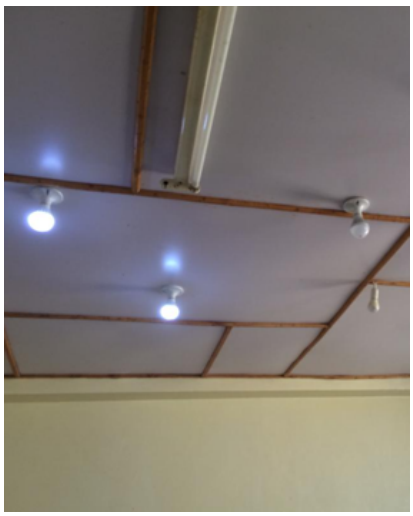
When no one at the Hospital was capable of fixing equipment, repair requests were sent to the ORHB. At least in theory, a higher level of skill was available there. The Hospital would send request letters and depending on when it was suitable for the ORHB, someone would be sent to look at the problem. According to Hospital leadership, this had taken several months in the case of the X-ray machine (02). The

person's travel costs were always covered by the Hospital (32). However, as had been the case with the X-ray machine, even the ORHB representatives were not able to fix particularly complex problems. According to a member of the Hospital's leadership (02) the ORHB had sent more than one person that had not been successful repairing the X-ray machine. The only alternative left was to replace it.

6.3 Lighting at the Hospital

The bight, florescent lighting that, at least in the Western world, is associated with hospitals was not a reality at the Hospital. Small rooms generally had one functional standard A-series shaped lightbulb in the ceiling. Larger rooms, such as wards with multiple patient beds, appeared to have about two such functional bulbs on average. Some rooms, including the OPD examination room for gynecological and obstetrics patients, had no ceiling lights at all. This room relied on a standing lamp that looked to be designed for household reading purposes. In most Hospital buildings there were remnants of a, presumably, brighter florescent lighting system that was once used. However, this system was no longer functional. This, according to one informant who had worked at the Hospital since it opened (10), was because the florescent system was more sensitive to voltage fluctuations and thus more easily became damaged. A switch was at some point made to the current lighting system, which was not as damage prone.

Bulbs from the new lighting system wrapped around the old tube lighting system in a patient ward. Only one of the lights was functional.



Bulbs from the new lighting system surrounding the old system in the delivery ward. Only a few of the bulbs were functional.

Due to the dim electric lighting, most buildings relied heavily on natural light during daytime hours, whether there was electricity or not. In the wards I often observed curtains and windows open to let in sunlight and for ventilation purposes. In the evening and night hours, dim lighting was the norm. Concrete examples of how this impacted informants included difficulty locating veins which complicated drawing blood and setting IVs, as well as trouble reading vital sign measurements, for example from thermometers (13, 14).

Poor lighting was an issue when there was electricity, but it was an outright problem when the electricity was out, particularly after dark. When the electricity was out and the large generator was not running, the ICU room relied on one solar-powered A-series bulb in the ceiling. In the Delivery ward the small generator powered only a few rooms. These did not include the patient room where mothers waited pre-birth and recovered with their baby post-birth, nor did it include the staff room. However, the biggest lighting challenges were in the wards without small generators. In the Ob/Gyn ward one informant (14) shared that when the electricity was gone after dark and the large generator was not running, staff relied completely on flashlights from their personal mobile phones or candles provided by the Hospital. There were no additional torches in the Ob/Gyn ward; candles were the only option provided by the Hospital. However, the candles were only intended for staff, not patients. Patients and their visitors were expected to use their own mobile phones or bring their own candles. A few informants (07, 08, 14) expressed that patients were not bothered by this. The patients came from the surrounding area and were thus accustomed to poor electricity conditions – their expectations were shaped by what they were used to. Since I was not able to interview patients, I was not able to verify this information. But, according to informants, patients never complained or made demands for electricity when it was not available.

Interestingly, it could appear that at least some of the staff also had low expectations, and thus few frustrations, related to lighting. In the ICU one informant (09) felt the light from the one solar-powered bulb, that was used when the electricity was out, was sufficient. In the Delivery ward two informants (07, 08) stated that poor lighting was never a problem. Yet, I had been told by other informants (05, 14) that the use of flashlights for supplementary lighting was a common practice throughout the

Hospital. When I inquired if staff in the Delivery ward ever used flashlights for this purpose, the same informants that said poor lighting was never a problem answered that in fact they do. However, they gave no indication of seeing a contradiction in this.

The Hospital was a bustling place. Patients frequently had large groups of family members accompanying them, and since there was no designated place for these people to wait, they ended up hanging around inside and outside the various Hospital buildings. The wards each had designated guards to try and keep visitors out, particularly during morning rounds and when rooms became too crowded. Visitors did their cooking, cleaned clothes and simply sat and waited around the compound. With such a large volume of people hanging around the Hospital buildings, it appeared to me that patient privacy was a problem, particularly when the buildings relied so heavily on natural sunlight from uncovered windows.

This notion was confirmed by a number of informants. A doctor in the Ob/Gyn ward (05) explained the situation in the procedure room, where minor, non-surgical gynecological procedures were conducted. The room was poorly lit when there was electricity and had no light at all when the electricity was out, unless the large generator was running. The Ob/Gyn ward did not have a small generator. While there was a window in the room, the procedures performed there were so privacy-invasive that opening the curtains was not a good option. Instead, the doctor brought in nurses simply to hold multiple mobile phones for sufficient lighting. The situation was similar in the OPD gynecological examination room, where there was also no small generator and the window had to remain covered. A nurse (06) explained that in the afternoon when the sun shone straight into the room, some light got through even when the curtains were closed. However, in the morning the room was on the shady side of the building and was quite

A folding curtain is set up for privacy while a patient is examined in a multibed room. Yet, despite being on the ground floor, the window and curtain are open.

dark. Staff in the OPD gynecological room were thus also dependent on mobile phone flashlights for sufficient light. While I heard about and observed some efforts to find patient-friendly solutions to the conflicting needs for light and patient privacy, these efforts appeared often to be restricted to female patients undergoing gynecological examinations and procedures. Other places, such as for example in the big in-patient rooms with multiple beds and in the ICU, windows were usually left uncovered and often open.

Several informants, both men and women, said they did not walk around town after dark. Staff working the night shift would arrive at the Hospital before it got dark, and only staff that had housing on the Hospital compound were expected to be on-call. No one was expected to come to the Hospital from elsewhere after dark, nor would they be willing to do so. I decided to follow these same guidelines myself. For this reason, I was never able to conduct observations at the Hospital during the night and was only twice able to make observations during the evening, after I was offered car transportation home.

Despite having only two opportunities to make observations after dark, it was quite apparent that the Hospital compound was poorly lit. Several informants agreed (05, 06, 14, 17, 23, 26). One female nurse (23) said, "*When it is dark there is not enough light outside at the hospital. I use my mobile phone light even when I walk between buildings.*". Two other female nurses (06, 26) told me that after it got dark, "*We prefer to just sit in the duty room, not walk around the compound.*" Though some areas, particularly around the Hospital buildings, had some lights, other areas were not lit at all. This included the area between the Hospital buildings in the front of the compound and the staff housing in the back. One male and one female informant (14, 17) explained that if they for example had trouble reaching an on-call doctor by phone, they would have to walk to the doctor's house in the back of the compound to fetch him. At night this was scary, they said. The woman responsible for turning on the large generator (10) also mentioned that her frequent walks to the generator in the dark was one of the reasons she was glad to no longer have primary responsibility for it. She and another female nurse (10, 14) said they always took someone along with them on their walks in the dark.

However, it was not only women who were uncomfortable walking in the dark; men expressed discomfort too. Furthermore, when I inquired about what staff were afraid could happen in the dark, the answers always related to wild animals. The compound was fenced in, but the fence was full of holes that animals (and humans) could easily pass through. Some informants (06, 26) mentioned the hyenas in the area and how they had previously entered the compound. Another (05) told me of all the stray dogs around the Hospital that she was constantly trying not to startle to prevent them from attacking. Another two informants (14, 17) mentioned that snakes were not uncommon on the compound, and that at one point there was a big one found in the Delivery ward. At night, it seemed staff would seriously weigh whether leaving the ward for any reason was worth the personal safety risk.

6.4 Summary: What influences staffs' actions?

Below is a summary of the findings from Chapter 5 and 6 in relation to the question of how the health system bureaucracy and the provision of electricity, electric equipment and electric light influenced the way workers at the Hospital perform their jobs and deliver health services. I have identified three themes that feature prominently. The first concerns how electricity interruptions were handled. Staff had formed habitual health care routines that continued, albite slightly altered, when electricity disappeared, or electric equipment was no longer available. For example, short surgeries could continue while OR staff bagged oxygen manually, and a stepping stool was used when the height of the OR table could no longer be electrically adjusted. Surgical practices were altered slightly to adjust to new circumstances, but routines continued to a large degree unaffected. Other examples included practices that had formed in response to electricity gaps. Staff automatically running out to turn on the small generators at the onset of an outage was a simple but clear example of this. In the NICU, neonates were routinely moved from their incubators and placed under the one heat lamp that functioned on the small generator. This simple lamp had fewer functions than the incubators and so nurses in the NICU then had to alter their practices by following up the neonates closer. These actions had become habits.

Yet, in other ways, a sense of unpredictability had created an unconducive environment for staff at the Hospital to develop routine actions, or at least for routines to persist. Generators were intended to lessen the impact of electricity outages and alleviate some of their burden. However, they only accomplished this to a limited extend, given their restricted running time and the only partial equipment they could power. If power outages outlasted the generators, there were no routines to handle this. Staff scrambled to find solutions. Similarly, electric equipment became damaged and dysfunctional regularly. A biomedical engineer was on staff to lessen the burden of equipment damage, but a restricted skillset left this person unable to make any significant repairs. A tight budget meant replacements were not an option. The availability of equipment could thus not be relied on and so practices were consistently altered or stopped as a result. A lack of consequential equipment, such as the X-ray machine, had ended certain surgical practices all together. Additionally, staff had experienced that higherup government agencies, in place to ensure the continuous supply of medical resources such as pharmaceuticals and blood to the Hospital, were undependable. A resource such as blood could not be relied on, which impacted the timing and flow of surgeries and other health care practices. The unpredictability staff experienced, or the lack of control they felt over their working conditions, appeared to have taken its toll. Often, they could not rely on routines but instead had to be prepared to improvise and handle unfamiliar circumstances as they came. As a consequence of this and other circumstances, apathy prevailed over motivation. This was, for example, seen among health workers who were unwilling to take responsibility for the equipment they had at their disposal or preferred to avoid situations that gave them more work.

A second theme that emerges in the findings is that the quality of health services delivered at the Hospital was influenced by low levels of skills, knowledge and motivation among staff. There were specifically three apparent explanations for this: 1) Several staff were forced to come to the Hospital right after completing their health care education, meaning many of them were young and inexperienced. 2) Related to this, many staff members were unhappy with their placement at the Hospital and disliked being there. 3) Retention and recruitment challenges at the Hospital meant experienced health workers were prone to leave their jobs and there

were a small number of specialists on staff. A general lack of experience created potential for poor clinical decision making and suboptimal health care practices. Staffs' unhappiness with their placement at the Hospital and low levels of motivation created a sense of apathy and disinclination to seek improvements in the workplace and work practices. Reduced skill levels meant resources at the Hospital, particularly advanced electric equipment such as neonatal monitoring machines and ultrasound machines, were not optimally utilized and could again lead to suboptimal medical practices.

Thirdly, the health care system bureaucracy and hierarchy placed restrictions on staffs' health care delivery performance. At the Hospital, the MC and government agencies served as resource gatekeepers, wielding huge influence over the medical supplies and equipment staff had at their disposal and thus the actions they were able to take. Doctors were the most powerful decisions makers in the wards, leaving little room for nurses and midwives themselves to evaluate their patients and make health care decisions. These staff members were simply expected to follow orders. Additionally, Ethiopia's strong pride culture discouraged honesty about mistakes and an openness to learning and improving among Hospital staff, that will be analyzed in the next chapter. In conclusion, a combination of unpredictability in the workplace, low skill levels and a sense of dissatisfaction among staff, as well as a system that appeared to disempower its workers were all influencing forces on the actions of Hospital staff.

7. EXPLORING THE DELIVERY OF HEALTH SERVICES THROUGH A PRACTICE THEORY LENS

To expand the analysis of elements that affect the production of health services beyond the health system bureaucracy, access to electricity and the use of electric equipment and electric light, I now analyze the material through a practice theory lens (Ortner 2006, Sahakian and Wilhite 2014, Sewell 1992, Westskog, Winther, and Strumse 2011, Wilhite 2013). Here I rely on the three dimensions of practices as described by Westskog and colleagues: *social norms and cultural values, non-human resources* and *human resources* (Westskog, Winther, and Strumse 2011), and seek to answer how the health care practices of Hospital workers were shaped by social norms and cultural values, the material resources at workers' disposal, as well as workers' knowledge, skills and motivation levels. Below, my discussion of these dimensions outline three levels of analysis: *social norms and cultural values,* including a high regard for urban settings, pride culture and gender norms, and how these influenced the production of health services; 2) circumstances at the *hospital level* that impacted what resources staff had access to, with a particular focus on electricity and electric equipment, and the extent to which they could utilize them; 3) variations in electricity between the *Hospital's departments* and subsequent differences in practices that resulted from this. I conclude this chapter with a brief summary of my analysis.

7.1 Influence of social norms and cultural values on health care practices

I begin my analysis of factors that impact Hospital staff and the health services they deliver by looking at the influencing forces of society, which immediately brings attention to social norms and cultural values but also other dimensions highlighted in practice theory. First, I consider how a high cultural value placed on urban settings negatively influenced staffs' satisfaction levels with their rural workplace and consider how this adversely influenced the availability of well-trained, experienced workers at the Hospital. I also consider how deficiencies in 'human resources', such as training and practical experience, influenced the amount and quality of health

services available there. Furthermore, I assess how the cultural high regard for urban settings translated to a power concentration in urban contexts that influenced the amount of 'non-human resources' such as medical equipment, pharmaceuticals, oxygen and blood Hospital staff had at their disposal. Next, I look at the pervasiveness of Ethiopia's pride culture and how it prevented improvements in the knowledge and skills of Hospital staff by hindering opportunities for learning. Finally, I consider whether gender expectations related to the use of electricity and electric equipment hindered women's access to and utilization of these material resources and thus their ability to produce quality health services at an equal level to their male colleagues.

7.1.1 High regard for urban settings: consequences for human resources

The significant cultural value placed on 'the urban' and the high social status afforded to those who lived there appear to be important contributing factors to the Hospital's challenge of maintaining enough high-quality staff to conduct good health care practices and ensure the provision of quality health services. The preference for and pursuit of cities and the social capital such places granted led to high turnover rates at the Hospital. In his reflections on structures in practice theory, Sewell notes that, "[w]hat kind of desires people can have, what intentions they form […] vary drastically from one social world to another depending on the nature of the particular structures that inform those social worlds (Sewell 1992, 20). At the Hospital, social pressures on staff to disassociate with 'the rural' appeared to serve as a form of structure that prevented many from settling and finding satisfaction in their current workplace.

The structure formed by the high cultural value placed on urban living had significant implications not just for the actions of Hospital staff (leaving their jobs) but also for the human resources staff that remained had at their disposal. Attitudes, knowledge and skill levels of workers were all affected. A severe shortage of employees meant staff worked extra shifts and long hours, leaving them feeling overworked and frustrated. Under such conditions I sensed there was little motivation to go above and beyond the minimum of what was expected, and health

service delivery presumably suffered accordingly. A high turnover rate also contributed to a draining of knowledge and knowhow from the Hospital. As mentioned in Chapter 5, this was a problem among general staff, but perhaps even more concerningly, it was also a problem among the most senior positions at the Hospital. As found, the CEO and MD positions had in the past years regularly been left vacant and in need of replacements. Institutional memory was hard to develop. Giving employees training opportunities did not appear to be a good long-term investment, due to the high probability of them seeking jobs elsewhere. The Hospital was unlikely to retain the new or improved knowledge and skills for very long.

Additionally, social pressures to seek work in urban areas and the consequent high turnover rate at the Hospital had implications for the formation of habits or habitus, as described by Bourdieu, among staff. Firstly, as more staff members left their jobs, remaining staff were frequently shifted between departments to cover gaps. Their socio-material histories, which Wilhite identifies as important determinants of habits (Wilhite 2013), were too short in each department. Many health workers were in a consistent state of learning and adjusting to new expectations and resources available in their new location, perhaps never getting comfortable enough to develop practices and confidently deliver care. Secondly, since the support of colleagues (particularly colleagues' skillsets) was an important resource staff relied on in several health care practices, changes had to be made to practices once these colleagues (and their skills) left. Health care practices had to be altered to either fill the skills-gap left by colleagues that quit or adjust to the skillset of new colleagues that came to replace them. In essence, consistent changes in staffing appeared to limit the lifespan of health care practices at the Hospital.

Finally, because the Hospital was located in an undesirable, rural place it not only had a hard time retaining staff; it also had trouble recruiting the specific staff it wanted and needed. This meant certain positions and special competencies sorely needed at the Hospital remained vacant, limiting the technical support staff got and the health services the Hospital was able to offer. Additionally, the only people who could be forced to come were recent graduates that owed the government service years. This meant the Hospital staff consisted disproportionately of young people who lacked practical experience. Even the most senior medical authority at the

Hospital, the MD, was a relatively recent medical school graduate. These recent graduates' socio-material histories in the health care sector were short. They may not yet have formed health care routines that could help them manage their daily responsibilities. Instead, they were still developing good decision-making abilities and clinical skills and relied heavily on the support of senior staff with longer histories in the health care sector (who were in short supply) in this process. Furthermore, the findings from the study highlight how those forced to come to the Hospital often had little desire to be there, and motivation levels appeared to suffer accordingly.

Cities were not only significant to informants because of the desirable living context they represented. The way informants spoke of the far-away government institutions that oversaw the Hospital indicated that they perceived 'the urban' to represent power over the Hospital. The RHB that oversaw the Hospital was located in one of Ethiopia's largest cities, Adama. The people who decided over the Hospital's budget as well as the medical equipment it was allocated were thus located there. As noted in Chapter 5, when larger equipment repairs were required, the Hospital was dependent on engineers sent from Adama. Since it was the RHB's prerogative to set priorities, this could take time, as it had with the Hospital's X-ray machine. In a similar way, policy decisions regarding foreign currency and pharmaceutical imports were made in Addis Ababa, the country's capital and largest city. Additionally, several of the crucial resources the Hospital needed to function and deliver health services, such as oxygen and blood, had to be collected from urban centers.

My interviews and observations revealed how Hospital workers felt decision making and governance at higher levels (in urban centers) limited the quality of their health care practices. Higher up government bodies were seen as funding regulators and resource-gatekeepers. Important decisions that directly impacted Hospital workers and the care they could provide were made over 400 km away, and few seemed convinced that the powerful people in the cities were concerned with the rural Hospital's best interest. This top-down approach created an unequal power distribution between the Hospital and the institutions that oversaw it, which staff believed restricted their access to essential resources, including blood, pharmaceuticals and electric equipment. This gap between the resources staff felt

they needed and the resources they actually received left them feeling that their material working conditions were to a large degree out of their control. They believed material restrictions imposed by far away institutions negatively impacted their ability, or agency as Ortner calls it (Ortner 2006), to improve health services at the Hospital. This experienced constraint backs up Sewell's claim related to practice theory that an unequal distribution of resources among agents and social groups results in unequal opportunity for action (Sewell 1992, 21). There was a general sense of frustration that if the government could not be relied on to utilize its power to the benefit of the Hospital and its workers, it could not in return expect Hospital staff to deliver top-quality health services. Instead of creating resolve to alter or transform the top down approach and power imbalance, this structure created by the health system bureaucracy appeared to have been accepted by staff as the status quo and created a sense of apathy.

7.1.2 Pride culture impairing learning

Another factor related to the society level that had implications for health service delivery at the Hospital was the national pride culture. As it would anywhere, an inability to identify, acknowledge and correct mistakes left little room for learning and created challenges for improving the level of health services delivered at the Hospital. When considering the elements that go into a practice such as health care delivery, especially the human and non-human resources, it seems likely that improved inputs would yield improved outputs. In other words, improved drugs and equipment as well as skills and knowledge, would produce better health care. Unfortunately, the country's pride culture was hindering improvements to such human resources at the Hospital. An unwillingness to receive critical feedback or recognize one's mistakes meant staff were reluctant to acknowledge dangerous lapses in their health care routines, and suboptimal health care practices likely formed as a result. The importance of changing mindsets in LMIC health systems towards a willingness to learn was recently highlighted by Margaret Kruk and colleagues who concluded that, "health systems require not only physical tools, such as equipment, medicines, and supplies, but also new attitudes, skills, and behaviours, including quality mindsets, supervision and feedback, and the ability and willingness

to learn from data. The foundations alone will not create good care, and the system will not be able to adapt to new challenges without built-in mechanisms for learning and improvement, including having timely information on performance, assessment of new ideas, and the means to retire ineffective approaches" (Kruk et al. 2018, 1202). Pride culture appeared to prevent these essential 'mechanisms for learning and improvement' to advance at the Hospital. Additionally, pride and blame-assigning by staff contributed to workplace conflict and thus also to a lack of teamwork and productivity.

While the medical hierarchy was strictly adhered to at the Hospital and doctors had a high level of authority, it is interesting to note that not even authority or seniority trumped pride culture. One of the incidents mentioned in Chapter 5 of a working relationship turning sour when a senior staff pointed out the mistake of a junior staff in the OR is an example of this. Though it might be assumed that belonging to the senior ranks of the Hospital conferred social capital, as described by Bourdieu, that allowed for this room to act, the reality was in fact not so straight forward. The junior staff member did not accept the criticism from the senior staff member; instead he became offended and obstructive. In this sense, at the Hospital the cultural value placed on protecting one's pride, at least at times, outweighed the strong social expectations of respecting one's superiors.

7.1.3 Dismantling gender norms for equal participation in health care practices

A final point to note on the society level of my analysis relates to how socially prescribed gender roles played out at the Hospital, particularly in relation to the use and management of electricity. Going into my research I hypothesized that electricity and electric equipment might be considered the domain of men, or that men held responsibility for turning on generators and managing the electricity supply. My assumption was based on findings in the literature (Winther 2008, University of Oslo et al. 2019) showing that society often prescribes men technical tasks and consequently women's involvement in this domain is reduced. I considered that expectations around gender roles were potentially serving as a social structure that restricted women's access to and utilization of electricity, thereby disadvantaging

them in the practice of delivering quality health services in relation to male colleagues. The findings, however, do not necessarily indicate that this was the case. In fact, as noted, up until just a few months before my arrival at the Hospital, it was a woman who had for years managed and maintained the Hospital's largest, most crucial generator.

As noted in Chapter 5, in one of my first interviews two male staff told me that women in their department were unable to turn on the small generator, which initially appeared to confirm my hypothesis. However, as I later discovered, the limiting factors they were referring to were not necessarily related to a lack of interest or technical capabilities but rather of body size and strength. The generator had to be manually turned on, something that required a lot of physical force. The two men I spoke to did not necessarily believe women were excluding from handling the generator because they were not technically capable. Rather, they were making a statement about what they believed were the limits of women's physical strength. As a side note, this is a bit paradoxical as women in Ethiopia are often assigned the most physically taxing domestic labor such as fetching water and ploughing the fields.

The physical strength required to turn on the small generators did in fact appear to have led some women to assign this task to men. On the other hand, it had led other women to seemingly seize an opportunity to step outside expectations and demonstrate their equal abilities. This group of women were offended by any suggestion that they could not handle generators as well as men. Not only were they physically and technically capable of using the generators, they were eager to share that they could perform minor maintenance as well. As found, at least two of the men I spoke to were convinced; one even claimed he sought support from a particular woman when he needed help. The generator-savvy women had, using their "transformative powers" (Sewell 1992), actively sought (and maybe were still seeking) to prove that they could be counted on to ensure the availability of electricity and thus also the delivery of quality health services. This approach is an example of agents transforming structures, which is how Giddens believed practices change over time (Ibid.). It is possible that without this active pushback gender norms could have created lesser access to electricity for female Hospital workers', as the literature has shown is possible, and hampered these women's ability to provide

quality health services equivalent to their male colleagues. Instead, female staff had worked to alter gender expectations, and thereby the structural limitations they imposed, and were independently and equally able to access electricity and produce the level of health care this allowed. This exemplifies what Ortner calls the dialectical relationship between the structural constraints of society and culture and the practices of actors (Ortner 2006).

7.2 Distribution of skills and control over resources in the production of health care

The hospital level of my analysis considers factors that impacted access to non-human resources, particularly electricity and electric equipment, at the Hospital as well as staff members' autonomy and ability to utilize these resources as they delivered health care. I begin by assessing the level of control staff members had over their working conditions and their room to act in the health care delivery process. I then look at their preparedness to utilize the equipment at their disposal, their skills and motivation to preserve that equipment, and whether technological solutions are always the most suitable in the Hospital context. I conclude the hospital level of my analysis by considering the role of two important resources produced by electricity – light and telecommunications – in the production of health services at the Hospital.

7.2.1 The struggle to secure needed resources

As discussed, one of the constraints placed on health service delivery at the Hospital, according to informants, was the strong influencing power of the government institutions that oversaw it. Another was the bureaucracy and hierarchy at the Hospital, which informants believed also played a determining role in their material working conditions, their training opportunities and thus also their agency. The department heads formally held the highest level of responsibility and were the most senior decision-makers in the wards. However, doctors held the most authority.

Senior nurses and midwives, who may have had several more years of experience, were expected to follow and not question doctors' decisions. The doctor title outweighed all seniority and authority in the Hospital's hierarchy, indicating the valuable cultural capital such a degree assigned. From a practice theory perspective, the imbalanced division of authority between doctors and nurses formed a social structure that presumably restricted the agency of nurses to make health care decisions they felt were better or more correct than those of the doctors. While it may be common in all medical contexts for doctors to hold high levels of authority, the Ethiopian pride culture made disagreement or descent from a junior to senior level nearly impossible, ensuring that doctors at the Hospital had a strong advantage in terms of decision-making and agency. Additionally, since doctors at the Hospital were usually young and inexperienced, it is not unlikely that this could have had negative implications for health services delivered there.

As stated in Chapter 5, the MC was also seen by informants as powerholders that could influence their working conditions, especially materially. Informants expressed frustration that the MC rarely sought input from them on needs in their wards and that requests made were rarely granted. Looking at this with a practice theory lens, though staff had developed routines that allowed them to produce health services using only the resources at their disposal, it was clear that they believed more and better non-human resources were a premise for improving their practices. They viewed the MC, in addition to the government institutions that oversaw the Hospital, as both the means and obstacles to getting these needs met. In this sense these institutions formed a structure that could both facilitate or prevent staff members' access to material resources needed for health care delivery.

Presumably the members of the MC were supposed to be representative of the Hospital staff and should in theory therefore also represent their interests. But not every ward was represented on the MC; not even every gender was. Interestingly, the members of the MC did not even seem to have considered that the interests of women might be poorly represent in their forum, even though there were no women on the committee. When I pointed out the lack of women, I got the general impression that this had gone unnoticed by members. It is thus not difficult to understand why several staff members felt their interests were not properly

considered or prioritized. Female staff especially may have experienced their exclusion from the MC and lack of representation as a barrier to getting their particular needs met at work. Similar to their feelings about the government institutions that oversaw the Hospital, informants indicated that the management structure at the Hospital gave them a feeling that several workplace circumstances were out of their control. This sense of disempowerment appeared to affect job satisfaction and presumably also influenced dedication levels to their jobs.

Though staff perceived the MC to have at least some level of influence over their work situation, after my time at the Hospital I was left questioning whether the MC actually had any significant influence (or power). My doubt results from the realization that budgetary restrictions appeared to give the MC limited room to act. After daily running costs were covered, there was simply very little money left for equipment repairs, facility renovations and additional supplies. The MC appeared unable to meet staff members' requests, not because they were unwilling to listen to their needs, but because there was nothing they could do about those needs. The budget would simply not allow it. In this sense, an issue the staff perceived to lie at the MC level was in fact an issue that steamed from the regional or federal level where budgets were allocated and approved.

Rules and producers at the Hospital also regulated the access Hospital workers had to non-human resources needed to carry out their health care practices. As seen, the number of people who could approve resource requests depended on the scarcity of that resource. The less available the resource was, the fewer people had access. Among other consequences, this meant women had much lesser access to blood than men, since blood was only available to doctors (1 female, 13 male doctors). Here we see that there was not only a perceived unequal distribution of resources to the Hospital from higherup authorities, there was an actual unequal distribution of resources among departments and staff within the Hospital as well. Again, Sewell's notion that an unequal distribution of resources among agents results in unequal opportunity for action is relevant to consider (Sewell 1992, 21). Restrictions on lifesaving resources had important implications for certain groups at the Hospital and their health care practices. For example, staff in the ICU and NICU had resorted to routinely relying on oxygen concentrator machines rather than oxygen cylinders

because cylinders were rarely made available to their departments. Their previous interaction with (limited) materials had "carved out predispositions for subsequent actions" (Wilhite 2013, 62) and forced them to form such a habit. Thought staff believed oxygen concentrators were a suboptimal solution and thus resulted in suboptimal care, they had no choice but to rely on them and form their practices accordingly.

In one sense, electricity was another resource that was out of the Hospital's hands, as grid electricity would come and go according to no set schedule. However, backup sources, such as the small and large generators, gave the Hospital some level of control over the electricity staff had access to. Yet, even with multiple backup electricity sources available, a steady supply of electricity could not be guaranteed and therefore could not be relied on by the Hospital staff. The large generator was expensive to run and was thus usually only turned on when the OR needed it. It was also limited to running for a few hours at a time. Not all equipment could run on the small generators, and the use of these was also time-restricted. Habits as well as nonroutine actions that resulted from this lack of reliability will be further discussed by department below. For now, it is important to note that even a fundamental infrastructural resource like electricity felt out of the Hospital's, and its workers', hands and could not be relied on in their delivery of health services.

The material constraints felt by the Hospital staff was at first puzzling given that new, unused medical equipment could be found throughout the Hospital. Why was equipment that seemed unnecessary, and even unwanted, prioritized over things that appeared desperately needed, including pharmaceuticals, oxygen and other medical equipment? Though at first glance odd, this paradoxical situation is important to understanding the lack of control Hospital staff felt over their material working conditions. Instead of getting allocated the things they needed and requested, Hospital staff had to simply receive what they were distributed by higher ups, whether they needed it or not. NGOs and international donors appeared to have provided the ORHB with medical equipment they believed was necessary or things that would be useful to achieve their (these NGOs' and donors') own health and development priorities. ORHB had then distributed these things to health facilities throughout the region (including the Hospital), without anyone actually requesting

them. This equipment could not be exchanged for resources that were truly needed, so in some instances it sat in storage units and wards collecting dust. One of the implications this 'receive-what-is-given' system had on health care practices was evident in the OR where the Hospital had three operating rooms, three donated anesthesia machines but only one operating table, as noted in Chapter 6. This restricted staff to using only one OR (when they possibly could have used at least two or even three), putting extra stress and strain on health workers and the services they were able to deliver. Waiting was the only option when the OR was already in use, even when patients were in critical condition and their situation was deteriorating. Waiting had thus become their (inefficient) routine.

7.2.2 Insufficient teaching and skills as obstacles to optimal equipment utilization

As I have argued in the sections above, my informants felt strongly that their poor access to, and thus low utilization of, material resources at work were largely due to the health care system's bureaucratic structures and processes out of their control. However, during my time at the Hospital I came to realize that low utilization of resources when performing health care practices, particularly electric medical equipment, was also impacted by other factors. One of these was the varying levels of know-how, or skills, among staff to utilize the equipment available. As explained in practice theory literature, while the non-human resources people have at their disposal are crucial to the development of practices, equally important are the human resources these people possess (Sahakian and Wilhite 2014, Westskog, Winther, and Strumse 2011). This was also the case at the Hospital, where knowledge and skills impacted how staff used the resources at their disposal to produce health services.

Agency to act and produce health services was to a large extent dictated by the skills conferred by the education and degree obtained by staff. In this sense senior doctors had by far the most room to take action. On example from my findings that illustrates this point is the fact that only two of the specialized senior doctors and a radiologic technologist knew how to use the Hospital's ultrasound machines, technology that can be essential in a diagnostic process. Since most nurses at the Hospital were not specialized in any particular field of medicine, it can be assumed that their ability to

utilize the specific equipment in their departments was at least initially low. Nurses and midwives, particularly in the OR, NICU and Delivery ward (where the most advanced equipment was located), had to learn to use much of the electric medical equipment available to them while on the job or during short-term training opportunities outside the Hospital. The successfulness of these learning processes appeared to have been limited. As I mentioned in Chapter 5, senior staff did not believe the midwives in the Delivery ward were proficient enough in the use of fetal monitoring machines to use them safely. Another example is the three nurses in the NICU who admitted they were not familiar with all the functions on the newborn incubators in their unit and said they would not know how to troubleshoot if they encountered any problems.

To understand the current knowledge and skills level among staff, it seems necessary to take a more critical look at the learning processes staff go through. The new nurse in the NICU, who was learning to use the equipment there from her three, not fully equipment-proficient colleagues, provides some insight. If we recognize that practices are formed through socio-material histories (Wilhite 2013), then we know that the practices of the new nurse in the NICU will be formed by both her social surroundings (the three other people she works with) and the material resources at her disposal. Her routines will presumably soon look much like those of her colleagues. Unfortunately, if her colleagues are not fully competent in the use of equipment and are thus not using everything correctly, suboptimal practices will likely be emulated and carried on by the new nurse as well. A cycle of suboptimal care is in this way created.

A similar example of suboptimal use of equipment relates to the fetal monitoring machines in the Delivery ward that were originally purchased by an NGO worker seconded to the Hospital some years ago. The NGO worker completed training sessions on how to use the machine with the Delivery ward staff at the time. However, now, after the expatriate midwife had completed her assignment at the Hospital and left, it was non-expert Hospital employees who were responsible for transferring knowledge on how to use the fetal monitoring machines to new staff. The fact that new staff in the Delivery ward relied heavily on in-service training from peers, who themselves were not experts, appeared to be leading to a mere transfer of

suboptimal habits. Similar to the example above, the old staff in the Delivery ward played an important role in shaping incoming staffs' dispositions for using the fetal monitoring machines, contributing to knowledge and skills development as well as routines for care provision that were in this case not ideal. Given that this is the training method relied heavily on throughout the Hospital, it seems reasonable to assume that this flawed learning pattern is not specific to only the NICU and Delivery ward.

Another noteworthy point on the topic of skills is that not only did staff need sufficient technology and medical skills, they also needed satisfactory discernment skills to understand their own limitations, for example when they did not possess sufficient technology and medical skills for a task at hand. Not everyone at the Hospital had this ability. The example of the health officers that started incorrectly diagnosing patients with an ultrasound machine they were still not proficient in demonstrates this well. For such staff members an inability to discern, or honestly evaluate, their own capabilities and restrictions resulted in certain material resources (such as an ultrasound machine) becoming useless, even dangerous, in the health care delivery process. At this point Akrich's concept of technology script is interesting to consider. Technologies are "scripted with a set of dispositions that have the potential to shape practices" (Sahakian and Wilhite 2014, 29). The introduction of a fetal monitoring machine had formed new health care practices in the Delivery ward; practices were altered from when staff tracked the condition of neonates using a Pinard stethoscope. The introduction of the fetal monitoring machine and the changes that it brought demonstrates the power Akrich believes technology can have over practices. However, according to my informants, the changes it brought were not necessarily positive ones. The machines were designed (or given a script) to be used for consistent observation, and the information the machines provided was expected to guide the decision-making process throughout deliveries. The intent of the machines was to help avoid emergencies by catching warning signs early. Unfortunately, rather than using the machines in this way, Hospital staff were simply waiting for emergency indicators that then triggered them to act. By this time the situation may have already reached critical levels. The usefulness and effectiveness of the technology was thus significantly reduced because staff were not following the

intended script. Furthermore, the quality of health services staff provided may have actually been reduced as a result of the introduction of this technology.

In a similar way, an insufficient electricity supply at the Hospital was also partially a result of staff not following technology script. The reason generators overheated after a certain number of hours and had to be turned off was presumably because they were used over capacity. The generators were not designed to power all the electric equipment connected to them. Consequently, their functioning duration was reduced, and staff were after just a few hours left yet again without electricity. Ultimately, their deviation from the generator's script reduced their access to the electricity it provided, effecting the health services they could provide. On the other hand, due to the very small capacity of the small generators, one might question whether the Hospital gained more from overrunning the generators for a short period, rather than being limited to running only basic things such as lighting for an extended period.

Issues around improper (and even dangerous) use of technology at the Hospital raises an important question that was touched on by one of my informants – is technology always the best option in such a resource-constrained context? Staff at the Hospital were generally young, inexperienced and demotivated, and the Hospital had a hard time maintaining institutional memory due to high turnover rates. Recruiting, building and maintaining the right skill level to ensure technology, at least of the advanced kind, was used properly and safely was incredibly challenging in the Hospital context. Would it perhaps, as my informant proposed, be better to invest in manual options, such as Pinard horn stethoscopes in place of neonatal monitoring machines? Earlier I stated that Hospital staff believed access to more and better non-human resources would improve their health care practices. While technology is today often blindly accepted as a material resource improvement, the situation at the Hospital puts a question mark by this general assumption. It seems basic, manual resources might be more practical for some staff and safer for their patients and their care.

7.2.3 Missing resources: the role of skills and motivation to maintain equipment

Low skill levels not only led to suboptimal use of electric equipment, it also contributed to the poor availability of such equipment at the Hospital. As stated in Chapter 6, there was general acknowledgement among informants that low levels of understanding about how to properly clean and maintain electric equipment was leading to high rates of equipment damage and dysfunctionality. The lack of consensus among informants about the reason oxygen concentrators so often became damaged is a concrete example of the knowledge gap that existed. A correct understanding of what caused this damage may have led staff to alter their equipment use, cleaning and storage routines to ensure it was better preserved. When considering the three elements of practice theory – human resources, non-human resources and social norms/cultural values – a lacking human resource (knowledge about how to prevent equipment damage) was leading to actions (or inactions) in the daily routines of staff that resulted in frequent equipment damaged (loss of material resources). This, in turn, was impacting health care delivery at the Hospital by forcing staff to alter their practices as equipment they usually relied on became dysfunctional and unavailable. When considering the forces, or structures, that impacted equipment availability, staff were eager to point to the uncooperative bureaucracy they worked within as the decisive factor. However, this is an example of how staff members' own knowledge levels also played a role in determining their material conditions and contributed to changes in health care practices as a result of lost equipment. Still, it can be argued that the structural barriers mentioned above that prevented training and learning at the Hospital (reluctance to invest in training due to high turnover and a high reliance on in-service peer training) meant that the knowledge gap among staff on how to properly care for equipment was in fact a result of the health care system bureaucracy rather than an individual failing.

Unfortunately, the person with overall responsibility for maintaining and repairing equipment at the Hospital had proved to not possess a sufficient level of skills either. Informants expressed minimal faith in biomedical engineers' skillset and ability to make any meaningful repairs. As noted earlier, they believed this engineering education program did not provide sufficient levels of training, meaning, in contrast to for example a medical degree, biomedical engineering degrees held very low levels of what Bourdieu describes as cultural capital at the Hospital. Experience, or socio-material histories, had time and again proved to staff that biomedical engineers

lacked the skills needed to repair damaged equipment. This had formed in them a routine of not even notifying the biomedical engineer when equipment became damaged. They simply altered their practices by utilizing other, usually manual equipment instead. Interestingly, informants had much more faith in the mechanical abilities of one of the Hospital's ambulance drivers. However, due to government policy that only allowed formally trained people to hold technical roles, he could not be employed as a mechanic or engineer. In this sense, government regulations were limiting repairs that could be made and restricting access to equipment, thereby playing a role in altering health care practices at the Hospital that relied on this damaged equipment.

Skills were not the only human resource staff needed to care for and ensure a decent supply of essential medical equipment. Motivation to care for the equipment appeared to be equally important, and for some staff this seemed equally missing. The demotivation among staff that has been mentioned various times in the sections above appeared to not only impact the health care staff delivered but also the sense of care they showed towards the Hospital's property. Dissatisfaction with being 'stuck' working at the Hospital, excessive work hours, an inadequate supply of resources and support, and low compensation all seemed to play their part. Additionally, informants pointed to the fact that they were constantly relocated to new departments and how this discouraged feelings of ownership and responsibility for equipment.

The importance of staffs' motivation to care for equipment becomes evident when comparing the different encounters I describe in Chapter 5 with staff in two different wards and their treatment of equipment. One, a young man unhappy with his posting at the Hospital and eager to find a new job elsewhere, had failed to protect equipment in his ward with simple voltage regulators, even though such devices were readily available in his department's storage unit. Damaged equipment was to be found throughout the ward, but the staff member was unable to give me much information about repair attempts or statues updates on repair processes. My interpretation of this situation was that limited job satisfaction was leading to a lack of concern for and even poor treatment of the resources he was provided to fulfill his duties. He imagined he would soon be elsewhere and would no longer need those resources.

This can then be contrasted with the other department where the head expressed a sense of dissatisfaction with living in the town the Hospital was located in but had resigned to staying because his wife was from the area. This man could explain to me all the workings of the electric system in his department and showed me all the intricate measures he had taken to protect the equipment there. His acceptance of his long-term employment at the Hospital seemed to have developed in him a motivation to preserve the equipment in his department, presumably to ensure decent working conditions for himself now and in the future. A sense of motivation and duty to care for equipment were important elements that, like a lack of skills, influenced the availability of equipment, and thus health care practices, at the Hospital.

It seemed a combination of frequent equipment damage, an inability to get the equipment repaired and consistently rejected equipment replacement requests had led staff to expect and accept their equipment limitations at work. A few, particularly those who foresaw a longer future at the Hospital, did what they could to ensure the longevity of equipment. But staffs' socio-material histories had showed them that the availability of resources, particularly electric equipment, could not be relied on. Everyone was aware that once something was broken it would unlikely be repaired or replaced. Rather than wait for improvements, it was better to alter practices accordingly. The need to adjust to new resource gaps thus seemed to be an important factor that led to changes in practices at the Hospital. Staff seemed to acknowledge that health care practices often became suboptimal as a result, but they felt they had no other choice. Though electric equipment may have temporarily empowered staff in their health care practices, as Sewell notes material resources can (Sewell 1992), it appeared to almost disempower them when that equipment inevitably became dysfunctional.

7.2.4 Suitability of technology in Hospital context

Still, it was not only a lack of skills and motivation to maintain and repair equipment that caused damage and reduced the supply of such resources at the Hospital. As seen, an inconsistent electricity supply that created large voltage variations had a significant damaging effect on equipment as well, particularly on autoclaves and refrigerators. When considering the question I posed above about whether

technological solutions are well suited for the Hospital context, this is another issue to consider. The conditions at the Hospital, both a damaging electricity supply and a low skill level for maintaining and repairing equipment, might be additional reasons to reconsider if technology is always the most suitable resource solution in such a setting. Furthermore, the fact that the Hospital's electricity supply was so inconsistent decreased the reliability of technology and the impact it could have. Staff always had to be prepared to use other (nonelectric) resources and take alternative actions. In situations that were technology dependent, Hospital staff had developed certain practices for when electricity was available and others for when the electricity was gone. It seems appropriate to consider if this dual system was really necessary in every case, or if, alternatively, some of these situations could be made less technology dependent.

It should be noted that efforts have been made by some medical equipment producers to develop products that are specifically designed to function well under circumstances such as those at the Hospital. The anesthesia machine in the Hospital's OR, for example, had a rechargeable backup battery for when the electricity disappeared. However, when I arrived at the Hospital this battery had already been dysfunctional for a few years and had not been repaired or replaced. This highlights that even when technology is specifically designed to fit challenging and unreliable circumstances, a lack of skills to maintain and repair the equipment remains a problem.

7.2.5 The role of staffs' lighting experiences and expectations in shaping routines

In a discussion about the role of electricity in the production of health services, lighting is an important aspect to consider. Before starting my research at the Hospital, I assumed that good lighting was an essential resource in such a context and that a lack of it during electricity outages would create challenges. The problems staff told me they experienced when drawing blood, setting IVs and performing surgery without light, confirmed my assumption. Lighting was an essential resource to perform the most basic to the most complex tasks at the Hospital. But, it was not only a complete lack of lighting during outages that was a challenge in the daily

tasks of Hospital workers. Dim lighting from insufficient lighting sources, even when electricity was available, appeared equally problematic in certain parts of the Hospital. As I mention in Chapter 5, to overcome this challenge staff relied heavily on natural sunlight and often left curtains open. It appeared that due to a history of inadequate electric lighting, the natural light windows provided had become an important, routine element in staff member's health care practices. So routine and embedded was the habit of relying on natural lighting that I did not observe any staff that appeared to consider its implications for patients, even though the shielding curtain they used to block the view of other patients in the room clearly indicated that patient privacy was something staff were concerned with. Still, no one seemed to perceive this as a breach of patient privacy that might have negatively influenced patients' health care experience at the Hospital.

On the other hand, staff were very aware of the conflict between leaving curtains open for sufficient light and protecting patient privacy when it came to performing gynecological examinations. As noted in the previous chapter, these were done in designated examination rooms with notoriously poor lighting and staff had to get creative to find lighting solutions. Efforts were made to keep curtains closed and instead rely on mobile phone flashlights. Though I did not witness such an examination myself, I can imagine that having people shine mobile phone flashlights on you while undergoing a gynecological examination can feel invasive and privacy breaching as well. While this may have been the lesser of two evils (flashlights versus open curtains), it is far from an optimal solution. Furthermore, given the nature of gynecological examinations, it seems safe to assume that female patients experienced the negative consequences of poor lighting and consequent privacy breaching activities to a greater extent than male patients.

While an unsatisfactory level of lighting was acknowledged as a challenge by workers in certain Hospital departments, such as in the OR and Ob/Gyn ward, workers from other departments did not feel insufficient lighting was a problem. As noted, this was despite their admission that they regularly relied on additional sources such as mobile phone flashlights or headlamps while performing their work to supplement existing room lighting. Though this seems contradictory, I believe my own experiences from Ethiopia help shed some light on the inconsistency between

what I observed and what I was told. From what I have seen, bright lighting is uncommon in Ethiopia. In private homes and in public places dim lighting is the norm. Using light from mobile phones to supplement when necessary is common practice. This was a reoccurring condition and action in informants' socio-material histories, even outside the Hospital. Throughout the course of their lives, Hospital staff had come to see what I consider dim lighting as normal, and using supplementary light sources had consequently become a regular part of their lighting practices. Predispositions had been formed that led staff to not consider the use of torches and mobile phones as something 'extra' that was inconvenient. In fact, they did not give much thought to the use of these devices at all, so embedded where they in lighting practices. As Sahakian and Wilhite state, our dispositions are "constantly confronting and mediating new experiences", and in the process habitus changes (Sahakian and Wilhite 2014, 27). But a limited supply of light was not a new experience for Hospital staff and therefore did not need to be 'mediated'. It was the norm, and so for staff lighting practices continued as they had throughout their lives without much thought.

I observed a similar situation with regard to electricity in general at the Hospital. As I mention in Chapter 5, when I asked informants about the reasons they were dissatisfied with working at the Hospital not once was electricity mentioned without my prompting. Unreliable electricity was the norm, not just in rural areas but in cities as well. In the whole country experiencing long or short periods of interrupted power was normal, and so daily routines had developed around it. If your coffee could not be made at a café due to an electricity outage, you simply waited. If the hairstylist could not style your hair because of a lack of power, you came back another time. There was no reason to get upset or complain. This was daily life, something you simply had to deal with. A similar mentality seemed prevalent among Hospital staff. Power outages were to be expected, at the Hospital and any other health facility, even in urban areas. An improved electricity situation was desirable, but staff seemed to know it was nearly impossible to obtain. Dwelling on this gap was pointless. Instead, staff developed practices that worked around it (such as bagging oxygen manually and placing neonates under simple heat lamps), or in some nonlife-threatening instances simply stopped performing their practices because it was not possible to continue. The informants that seemed most troubled by the unreliability

of electricity were the ones that handled critical cases, such as the OR staff. For them, even just their short socio-material histories in the health care field had taught them that electricity could determine life or death for a patient. Their experiences had showed them the crucial role this resource played, and they had consequently developed higher electricity expectations than other colleagues because the effectiveness of their health care practices was so dependent on it.

7.2.6 Interrupted telecommunication: impeding access to clinical support

Thus far I have discussed the important role of electricity, the medical equipment it powers and the lighting it provides as essential resources in the production of health services at the Hospital. As my final topic in the hospital level of my discussion, I consider an indirect role electricity played in health care delivery by facilitating communication between Hospital workers. As found, a lack of electricity often meant the mobile network was also down, hindering calls for assistance or for clinical advice between staff. It has already been recognized that knowledge, skills, motivation and other human resources played an important role in the production of health services at the Hospital. However, communication problems that arose when the electricity and mobile network were down highlighted that the production of quality health services was not only dependent on the human resources of individuals physically administering the care; it could also depend on the knowledge and expertise of other colleagues who were not actually present. In fact, the know-how of, for example, senior doctors on-call could be determining to the proper delivery of health services. Electricity, and the mobile communication it enabled, was important for facilitating access to this critical guidance as well as to call for assistance (supplementary skills) when needed.

However, when the mobile network was down, reaching senior staff for consolations and support was impossible by phone. Instead, senior staff had to be physically located, and so access to their expertise depended on the mobility of staff. During evening hours, when senior staff were at home (in the far back part of the compound), this was problematic due to poor lighting. As explained earlier, none of the staff I spoke with (women or men) liked walking around the compound in the

dark, particularly for fear of wild animals. This created a dilemma for staff facing complicated medical situations during nighttime hours – try to figure things out independently or seek support? In other words, it is possible that a lack of mobile connectivity and lighting on the compound further discouraged staff from seeking out senior staff, and the supplementary human resources they provided, to support them in making the best possible decisions and providing the best possible care for their patients.

7.3 Electricity hierarchy: impact on health care practices by department

The final level of my analysis, the departments, considers how differing degrees of access to electricity and electrical equipment in the various Hospital departments impacted the staff that worked there and the health services that were delivered. I begin by describing the various departments' position within what appeared as an 'electricity hierarchy' at the Hospital and point to the implications this had particularly for female staff. I then conclude by considering the added workload staff members had as a result of improved access to electricity from generators and discuss how this ultimately appears to have had negative implications for staffs' job satisfaction and the health care they provided.

7.3.1 ICU and Kitchen: Ranked high and low in the electricity hierarchy

Though there were electricity challenges throughout the Hospital, the situation varied substantially from department to department. While departments like the OR, Delivery ward, NICU and ICU had grid electricity, their own small generator and were connected to the large generator, the Hospital Kitchen and Cleaning department had none of these. One conclusion that could be drawn from this electricity hierarchy is that it indicates the value placed on each department by the Hospital's management and health care sector. If this is the case, it is interesting to note that the departments that are traditionally considered women's work in Ethiopia and are

usually staffed by women, notably the Kitchen and Cleaning departments, were least valued.

Though I made the conclusion above that electricity, particularly generator electricity, appeared to be equally accessible to women and men at the Hospital, when looking at the department level the picture becomes a bit less clear. In Ethiopia there are strong social expectations that particular professions are reserved for a certain gender. For example, jobs that entail tasks equivalent to domestic labor (cleaning and cooking) belong to women. This social norm forms a type of structure, in Gidden's sense of the word, that ensures a large majority of these undervalued and under-resourced professions are filled by women; or alternatively, that these professions have become undervalued because they are traditionally assigned to women. Either way, it was no coincidence that only women were affected by a lack of electricity in the Kitchen and Cleaning departments, and one might conclude that access to electricity at the Hospital was in this sense then gendered. Furthermore, it seems fair to say that when cooking and cleaning professions are under-valued and under-resourced this places a particular burden on women. At the Hospital this undervaluing resulted in the all-women cleaning staff being tasked with tough jobs, such as cleaning blood and excrement, without hot water. Women in the kitchen were exposed to high levels of unhealthy smoke from cooking over open fires in an enclosed space, which is consistently proven to increase risk of cardiorespiratory disease (Mortimer et al. 2012). The lack of resources – electricity and electric cooking equipment – led Kitchen staff to develop cooking practices that were dangerous for them. Though this practice may not have had negative implications for the health services produced at the Hospital and patients there, it did undoubtedly lead to unhealthy outcomes for the Kitchen staff themselves.

7.3.2 Electricity: generating work?

Though causation needs further exploration, research indicates there is correlation between higher levels of electricity access and wellbeing (Clancy et al. 2012, IDS 2003, White 2002). When starting my research, it was my assumption that this relationship would prove apparent in the workplace too – that higher levels of

electricity access would correlate with improved working conditions and maybe even higher job satisfaction at the Hospital. However, this did not necessarily prove to be the case. As noted in Chapter 5, I observed that in wards that had small generators, staff held additional responsibilities compared to staff in the wards that did not. Monitoring for power outages, stepping out to turn on the generator, physically turning the generator on, monitoring diesel levels, checking for overheating, and turning the generator off once the grid electricity returned were all extra tasks these employees were responsible for. During power outages staff in the Laboratory and Pharmacy store had to consistently monitor temperatures in the refrigerators where blood reserves and pharmaceuticals were stored to determine when to turn on the small generators. A drop too low could destroy these precious resources, meaning they would have to be discarded. Not only did this situation create ample room for human error, it also led to additional work.

The wards with small generators were more labor intensive in other ways too. As I mention in in Chapter 6, one midwife who alternated between the Ob/Gyn and Delivery wards told me that when the power went out in the Ob/Gyn department the lack of electricity meant a halt to activities. If this happened during the night, she could simply go to sleep. In the Delivery ward, however, the generator allowed activities to continue as normal. When working there she more rarely had breaks. The ICU was also a more labor-intensive ward due to the small generator there. As found, all patients that needed to be put on oxygen concentrators were sent to the ICU, not because they needed intensive care but because they needed oxygen from machines that were dependent on electricity. This had become a routine practice among Hospital workers. Patients who might otherwise be in the Ob/Gyn, Medical and Pediatric ward were all sent in the ICU because of the more reliable electricity supply there. This, in turn, reduced the workload on staff in most wards but increased the workload on staff in the ICU. The (technically) unnecessarily high number of patients there meant it was often overcrowded, and staff were constantly busy. By overstretching the ICU staff in this way the patients that did in fact need continuous monitoring and care did not receive this to the fullest extent. In this sense, though the small generator provided a benefit by allowing for a more reliable electricity supply, it also negatively impacted the health care practices and quality of care in the ICU by overloading staff and reducing their capacity to care for those who truly needed it.

It is interesting to note that the midwife who explained to me the different workloads associated with working in the Ob/Gyn ward and the Delivery wards also indicated that she preferred working in the Ob/Gyn ward, the one that did not have a small backup generator. Though I assumed a material resource such as electricity would be welcomed as an input that could improve health care practices and enhance efficiency of health care delivery, this was not the case. She preferred the Ob/Gyn ward, especially at night, because there was less work there. Her preference illustrates an important point – the last thing the overworked staff at the Hospital wanted was additional responsibilities and work, which is exactly what generator electricity created. Rather than seeking an increased number of responsibilities and tasks, several of the Hospital staff were actively looking to reduce their workload. This is not surprising when some of them continuously worked day and night shifts right after each other throughout the week. Though generator provided electricity was important for staff to perform their jobs and deliver quality health care, from a practice theory perspective it appears human resource deficiencies, including a lack of energy and motivation, led to a preference for more effortless health care practices. Consequently, there was also an aversion to material resources, such as electricity, that would fill staffs' days with labor-intensive work.

But generators not only created extra labor in a physical sense; they created additional mental labor as well. When the electricity disappeared in the Ob/Gyn, Medical, Pediatric and OPD ward things slowed down for staff there. There was no crucial medical equipment that cut out or nothing critical that could happen to patients as a result. Routines continued, perhaps with slight modifications because of a lack of light. However, when the electricity cut out in the NICU, ICU, OR, Laboratory and Pharmacy store, the situation was different. Initially staff in these wards had some habits to avoid the most serious consequences. In the NICU and ICU staff quickly went outside to turn on the small generator to ensure oxygen concentrators were turned back on. In the NICU staff also routinely removed newborns from their incubators and placed them all under the one heat lamp that functioned on the small generator. In the OR staff started immediately bagging oxygen for patients under anesthesia. But once this immediate step was taken, the OR staff were faced with a number of important decisions. They had to consider

various issues, including: When might the electricity come back?; How long would it take to get someone to turn on the big generator to make the anesthesia machine functional again?; How much time would they need to complete the ongoing surgery?; Was it feasible to continue bagging until the end?; Was there enough light to continue?; Would turning on the small generator be sufficient in this case? Workers in other wards faced situations that required similar mental labor. As mentioned, in the NICU I witnessed staff panic as they realized the small generator was about to overheat and shut down. This situation not only required significant emotional labor but also ample mental labor to figure out a solution. Even in what might be considered 'non-critical wards' tough decisions had to be made. In the Pharmacy store mental labor was required to predict the best course of action – move pharmaceuticals to ice chests or wait out the power outage? The added physical and mental labor, as well as stress, associated with generator electricity and the consequent rejection of it by staff do not mean that electricity was a bad or useless resource at the Hospital. Rather, it means that given other workplace circumstances and conditions it was currently an unfavorable one to some staff members.

If we consider these cases in light of Bourdieu's concept of habitus, we might conclude that one of the major benefits of humans forming routines and habits is the mental labor saved. Having to consistently weigh all options and determine the best or most rational course of action in every situation would be exhausting in daily life. As Schatzki says, practices, or habitus, "tend to reduce the scope and ordering power of reason" (Schatzki 2001, 5). Reasoning is not a labor neutral process; it requires work. By minimizing the scope of reason, habitus also minimizes the metal labor deciding on a course of action requires. At the Hospital some staff worked in wards that allowed for routines to continue as the electricity came in and out daily. The reasoning, or mental labor, required of them, as it related to electricity, was low. Other staff worked in wards where forming habits was difficult due to high electricity dependency and the inconsistency of its supply. Another problem was the uncertainty around the duration of power outages. If they were never more than one hour long the staff in the Pharmacy store could leave the pharmaceuticals in the refrigerator and the staff in the NICU would never have to consider what to do if the small generator overheated. However, the unpredictability of situations made forming habits impossible. For staff members in wards with small generators,

deciding on the way forward when the electricity disappeared therefore required significant amounts of mental labor. In the OR, for example, each patient's circumstance was different and thus the course of action had to be determined on a case by case basis. This uneven distribution of mental labor and daily pressures on staff in different wards may have given some workers an added disadvantage in their daily health care tasks by creating in them a stronger sense of being overworked and exhausted, feelings that were often referred to in my conversations with them.

7.4 Summary: Influencing factors on health care practices

To conclude this chapter on how the health care practices of Hospital worker were shaped by social norms and cultural values, the material resources at their disposal, as well as their knowledge, skills and motivation levels, I now summarize the major themes discussed. One of these themes is the pervasive impact the high cultural value on urban settings had on health care practices at the Hospital. Skills, knowledge and motivation levels were all effected, exemplified by, for example: low investment in training of staff due to expected high turnover; long workhours and constant shifting of staff between departments to deal with staff gaps; a small number of medical specialists employed and thus minimal clinical support available to staff. But the lure of urban contexts not only influenced human resources at the Hospital, it also impacted non-human resources. Low motivation levels that resulted from a desire to be elsewhere and feelings of being overwork, as well as several staff members' plans to leave the Hospital as soon as possible, led some employees to not properly care for and maintain the resources at their disposal (particularly electric equipment). Additionally, a lack of investment in training (due to high turnover) meant staff were generally not skilled enough to care for and maintain the equipment they had access to. In this sense, the high cultural value placed on urban contexts influenced human as well as non-human resources available at the Hospital, and thereby also affected practices performed there. Adjusting to resource gaps meant adjusting health care routines. This is an example of how all three practice theory elements as identified by Westskog and colleagues interplayed to affect practices at the Hospital.

Another socio-cultural factor analyzed – Ethiopia's pride culture – equally had its implications for health care practices. Pride prevented staff from taking responsibility for errors and seizing opportunities to learn from their mistakes. Important opportunities to improve practices were thus missed. As for gender norms, the division of responsibility for electricity and electric equipment was not gendered as expected at the Hospital. This appeared to be due to persistent efforts by female staff to break into and be viewed as equal actors within the electricity domain, and thereby be (and be seen as) equally reliable to provide electricity-dependent health care services. By breaking down this structure, women had ensured that men had no advantage, with regard to electricity, over them in the production of health services.

The Hospital's heavy reliance on in-service, peer-to-peer training, particularly for learning to use electric equipment, was another important influencing factor on practices. This form of training had in some cases developed in staff suboptimal health care practices that they themselves were not aware of. Though some Hospital staff recognized their own limitations when it came to using medical equipment, the majority did not. They followed the same practices as their peers and assumed this was correct. Examples of potentially dangerous outcomes when staff did not follow technology scripts highlight the critical implications this form of training and skills development could have on health care provided at the Hospital.

Though there were several conditions at the Hospital that contributed to staff demotivation, it should be noted that sporadic electricity and dim lighting did not appear to be significant demotivating factors. Hospital staffs' socio-material histories with dim lighting and unreliable electricity meant this was the norm for them. They did not have to alter their practices to adjust to these conditions, they simply continued their practices as they always had in daily life – with supplementary lighting sources and by waiting for the power to return. Familiarity with such circumstances meant the majority of staff were prepared to deal with them and did not become discouraged.

Another important factor that impacted the health care practices of Hospital staff was the way resources were allocated through the health system bureaucracy and how decisions were made in the medical hierarchy. Federal and regional oversight bodies

as well as the MC provided resources in an unreliable and unpredictable manner. Doctors, the most senior figures in the medical hierarchy, stood for all decisions about patients' care. These two structures (bureaucracy and hierarchy) placed consequential restrictions on the resources Hospital staff had at their disposal and the opportunities they had to make their own clinical decisions, in essence limiting the autonomy staff had to shape health practices as they saw best. The decision-making hierarchy in the health sector appeared to have had its implications for the electricity availability at the Hospital too. Health policy priorities were set at the highest level – by the federal government. Small generators had been placed in the wards of particular importance for these priorities. This, in turn, impacted the health practices that could be performed in each department, as well as the distribution of mental labor and stress faced by health workers in the different departments.

A final point to mention is that it was not just the unpredictability of electricity that prevented the development of routines and thus created more stress and mental labor for staff who then had to problem-solve. A generally unpredictable flow of resources, including electric equipment, blood, oxygen and pharmaceuticals, created an inconducive environment for routines to develop and endure. Predictability allows practices to remain stable; unpredictability does not. A constant need to adjust practices to resources gaps was a burden Hospital staff had to bear and, not surprisingly, this burden had led to apathy.

8. CONCLUDING REMARKS

While better access to electricity is already recognized by global health stakeholders as an important element to strengthened health systems in LMICs, and inadequate infrastructure and resources have already been identified as factors contributing to dissatisfaction and demotivation among health workers, only a limited amount of qualitative evidence to provide in-depth understanding of these conclusions exists. The current study set out to contribute to a more comprehensive understanding of realities health workers in resource-restricted settings face while delivering health care with a particular focus on health sector bureaucracy, electricity, electric equipment and electric light. Using a practice theory lens, I considered the *human resources* health workers at the Hospital had at their disposal, the *non-human resources* they possessed and the *social norms and cultural values* they were influenced by, and analyzed how these elements impacted the actions, and thus health care practices, of Hospital staff.

I have particularly sought to understand the electricity-dependent health care actions and routines of Hospital workers, and how these actions and routines form. My research found that a number of routine health care practices were imbedded in the daily work life of staff and were performed more or less habitually. Non-human resources, human resources and social norms/cultural values all played a part. When electricity disappeared, staff, without hesitation, turned on small generators, got out their mobile phone flashlights, started manually bagging oxygen in the OR and moved patients to equipment that functioned on the small generators. When nonconsequential electric equipment became dysfunctional health care routines continued, albeit in slightly altered ways. The use of a stepping stool and the manual tying of veins in the OR exemplified this. If the right type of blood was not available for a patient or the OR was not vacant, the routine was to wait. Health care routines were perpetuated through a system of peer observation and training that ensured the transfer of (at times suboptimal) skills and other human resources. Social norms and cultural values also influenced routines at the Hospital. A high regard for urban settings and a desire to be employed in such a location instead of the Hospital created a general sense of apathy that meant, for example, several staff members had

developed poor routines to care for equipment. The national pride culture also played a part in the formation of routines, as it did not allow for the acknowledgement of mistakes and thus ensured a perpetual cycle of unaltered actions.

However, there were also factors that disrupted routines and altered them significantly. Some of these factors even prevented the formation of routines in the first place. Again, non-human resources, human resources and social norms/cultural values all had a role. The unpredictable availability of non-human resources at the Hospital was a major contributor to routine disruptions. Once generators were turned on, there was no assurance they would outlast the grid outage. If they did not, staff had to improvise differently every time. There were no routine solutions at that point; they always varied. If consequential equipment became damaged, like the X-ray machine, some health care practices, such as certain types of surgeries, ceased to be conducted at the Hospital. The repair or replacement of such equipment could not be relied on. This could, in theory (though I did not personally observe it), also happen as the Hospital lost valuable human resources. If, for example, the only surgeon on staff left the Hospital for a more favorable location, the loss of his skillset would have detrimental consequences for the surgical practices at the Hospital. A number of surgeries would simply cease to be offered. Here again we see the power of the cultural value placed on urban living. Its appeal could result in a draining of knowhow and institutional memory that would drastically alter health care practices at the Hospital. The lure of urban settings also made it difficult for staff to adequately learn new skills and develop routines as their experience in each department was limited when they were constantly shifted between departments to cover staffing gaps.

If we return now to Chapter 4 where I presented the theoretical framework for my analysis, it is clear that a number of the central practice theory elements are at play in the actions of health workers at the Hospital. I have identified socio-cultural and material structures that influenced staffs' access to resources and training opportunities and thereby shaped their actions. I have emphasized the importance of health workers' past experiences, including their interactions with resources, such as electricity and light, as well as the social world (socio-material histories), that shaped and reshape their present-day acts. I have also considered how these experiences

have embedded expectations (and other knowledge) in staff that has led to the formation of habits, or habitus, as well as how these habits were altered with varying availability of resources.

However, this study also highlights an important contributing factor to the creation (or alteration) of routines: the predictability of circumstances. At the Hospital, unpredictability not only had the power to alter practices drastically, it could also prevent practices from forming in the first place. As staff were constantly adjusting to resource gaps – a lack of electricity, electric equipment, blood, oxygen, pharmaceuticals, bed space, nursing staff, specialist staff – practices were continuously modified to adapt to new circumstances. This was inevitable when the bureaucracy surrounding these health workers would not, or could not, ensure a steady or even foreseeable supply. Unpredictability even created situations where routines could not be formed, such as when generators overheated, because the solutions to this problem varied. As I noted in my findings, at one point while at the Hospital I observed an employee from a department barrowing a generator from another department in a time of desperation. This solution worked at that time since the generator was not being used by the other department, but if this had not been the case another solution would need to be found. Routines to handle situations in which grid and generator electricity were both unavailable could not be formed, at least not with the resources Hospital staff currently had on hand.

In the introduction to this study I argued that the medical and health field could benefit from more qualitative research that provides an in-depth understanding of research topics, rather than producing mere categorical or statistical findings. Previous studies on job satisfaction and motivation among health workers in LMICs have indicated that a lack of resources and infrastructure are contributing factors to workplace dissatisfaction. While this is a significant finding in itself, the current study provides important supplementary insight. Working with a lack of resources is tough, but perhaps even more taxing is working with an unpredictable supply of resources. Rather than forming routine practices around a set resource gap, unpredictable circumstances force health workers to constantly alter their practices according to changing resource gaps. This, as I detail in Chapter 6, creates a heavier work load for these health workers, which could be an under-researched source of

workplace dissatisfaction. Furthermore, while electricity is clearly an essential element in the production of health services, the qualitative methods utilized in this study show that low-capacity, unreliable backup electricity sources (such as the small generators at the Hospital) are not sufficient fixes. In fact, working in departments with such generators was undesirable to Hospital staff because of the extra work they created. Instead, it seems electricity solutions for the health sector must power all essential medical equipment and be reliable for a meaningful period of time in order for staff to find them useful. As this study demonstrates, the inclusion of qualitative research methods will be essential as the global health community seeks to understand the realities health workers in LMICs face and identify ways for them to find job satisfaction and deliver quality health services. The study also indicates that efforts to electrify the health sector in LMICs must take into consideration the daily experiences of health workers, including how they utilize electricity, electric equipment and electric light and how the health system bureaucracy works for or against them in this. It cannot be assumed, as it often is in the development sector, that any electricity 'improvement' will be beneficial. More research to understand electricity needs and optimal solutions in the health sector could be useful.

Finally, it should be noted that an important contribution of this study is that it demonstrates the intersecting nature of development challenges and, thus, the multisectoral approach needed to solve them. Universal access to electricity is not only an important goal in and of itself, it is also a prerequisite for ensuring health facilities are adequately electrified and health workers can provide lifesaving health care. In this sense, SDG 3 on health cannot be fully achieved without gains in SDG 7 on energy access. Taking this even a step further, equitable health care coverage, particularly access to sexual, reproductive and maternal health care, is a precondition for gender equality, and so, SDG 3, SDG 7 and SDG 5 on gender equality must all be seen as interrelated. These correlations should encourage development stakeholders to recognize that efforts to address these issues (and other development challenges) will benefit from greater cooperation and coordination between sectors.

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APPENDICES

Appendix 1: Participant consent form

Consent form for participation in research study

«Impact of unreliable electricity in rural Ethiopian hospital»

Background and purpose
This research project is conducted for the purpose of informing a thesis to be submitted as part of the Development, Environment and Cultural Change master's program at the University of Oslo in Norway. *The research will seek to document how staff in the Ethiopian health care sector, from senior management to support level staff, are impacted by access to reliable electricity, and how they cope in their work when such access becomes unreliable and limited?* The study has two aims:

> *1) To understand how grid electricity, backup generators and electrical equipment at the hospital are managed.*
> *2) To understand how hospital workers manage and deal with electricity limitations, how it impacts their performance and workplace motivation, and how they perceive it to impact patients.*

Factors such as gender, age, position and seniority of hospital staff will be assessed to determine if there are differences in access to electricity, participation in decision-making regarding its use and/or coping mechanisms to deal with limitations. An attempt will also be made to identify if similar factors in patients (gender, age, etc.) effect how the use of electricity is prioritized in their treatment.

To ensure comprehensive insight into the above questions, input from a range of staff at the hospital is needed. It is for this purpose that you are being asked to participate in the study.

What does participation in the study entail?
Research methods for this project include semi-structured interviews with various hospital staff as well as 4 weeks of participant observation in the hospital. This means study participants are consenting to being interviewed as well as being observed in the work place for 4 weeks. Interview questions will focus on how an unreliable electricity supply impacts staff's daily work, their motivation and their patients, as well as how staff deal with actual and anticipated power cuts. Additionally, interviews will include questions about the management of, access to and decision-making related to the use of electrical equipment and backup electricity sources such as generators. Interviews will be recorded and supporting notes will be taken by the researcher during the interview. Subsequently, the interview will be transcribed (written out). If interviews cannot be conducted in English, a translator will be used.

What will happen to your personal information?
All respondents have the option to remain anonymous. The researcher will note your name, position at the hospital, how long you have worked there, your gender, and

your contact information. If you chose to respond anonymously, you will then be assigned a number by the researcher. This number will be used by the researcher to link you to your responses. Your interview recordings/responses will only be marked with your number not with your name or other personal information that might identify you. Instead your answers and name/personal information will be stored separately. This is done to prevent people (except the researcher and her supervisor) from tracing your responses back to you. Study participants are encouraged to speak freely knowing that measures are in place to protect their identity. Similarly, in the final research report, respondents that wish to be anonymous will not be identified. The name of the hospital and its specific location will not be noted on research materials nor in the final report.

The research project is scheduled to end June 2019. At this point your personal information will be deleted.

Voluntary participation
Participation in this study is voluntary, and you can at any point revoke your consent to participate without providing a reason. If you chose to withdraw from the study, all your information will be made/remain anonymous.

If you have any questions about this study, please direct them to:

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The study is reported to the personal protection division of the Norwegian Centre for Research Data (NSD).

I have received information about the project and am willing to participate.

(Signed by participant, date)

Appendix 2: Respondent list

Respondent number	Type of position	Gender
02	Medical staff*	male
05	Medical staff	female
06	Medical staff	female
07	Medical staff	male
08	Medical staff	male
09	Medical staff	male
10	Logistical support staff	female
12	Medical staff	female
13	Medical support staff	male
14	Medical staff	female
16	Medical staff	female
17	Medical staff*	male
20	Medical support staff	male
21	Medical staff	male
23	Medical staff	female
24	Medical staff	male
25	Medical staff	male
26	Medical staff	female
27	Medical staff	female
28	Administration	male
29	Administration*	male
32	Medical staff	male

* Indicates the respondent was part of the Hospital leadership

Appendix 3: Semi-structured interview guide

The questions selected to be asked from this guide will vary depending on the interviewee (type of position, etc.) and the direction the interview takes.

1. Electricity usage

a) How do you use electricity/electrical equipment in your daily work?
b) What equipment do you use in your work? Is there any equipment you have access to that you do not use? Why?
c) Have you been trained to use it or learned on your own? Did you learn to use it here at the hospital or somewhere else?

2. Electricity supply/consistency

a) How regularly are there electricity outages at this hospital, for example in the last month?
b) How long do they last?
c) What is the longest time you can remember going without grid electricity at this hospital? When was that?
d) Does the electricity supply change with seasons?

3. Maintenance and repair of electrical equipment

a) Is there any electrical equipment in your department that is not functional right now? Do you know what the problem is/how this happened?
b) Who at the hospital is capable of repairing electric equipment? Who is responsible for repairs?
c) What is the process for reporting electrical repairs needed? Can you report such things yourself? Can you approach maintenance people about repairs directly, or must such requests be made through the administration?
d) In your experience, how long does it usually take before nonfunctioning equipment is repaired/attempted to be repaired?
e) In your experience, can electrical equipment usually be repaired, or must it be replaced?
f) How do you receive repair requests? Is there a formal process for this? Who do you receive maintenance requests from? Men/women?
g) How do you manage and prioritize these requests?
h) What are the most common causes that lead to damaged electrical equipment at this hospital?
i) What are the limitations you face to repairing equipment?

4. Backup electricity sources

a) Are there alternative sources of electricity at this hospital when the grid electricity is out?
b) Are the backup source(s) sufficient to meet the hospital's needs? Is there any equipment or facilities that cannot be run on a backup electricity source?
c) Can these alternative source(s) run continuously? If not, what are the limitations? How long can the backup source(s) run?
d) Who is allowed or who can to turn on the back up source(s)?
e) Who is responsible for maintaining it/them? Fuel? Repairs?
f) Do the backup source(s) always work? If not, what are the usual problems?

g) When was the last time you remember a backup source was not functional? How long did it take before it was functional again?
h) If there is a technical problem with the backup electricity source, is there usually someone on staff capable of fixing it? Who is this person/people?

5. Decision-making regarding use of backup source(s)

a) Which departments/building are connected to backup sources and which are not?
b) How do you feel about the way backup electricity is distributed at the hospital? Are there places you believe should be prioritized that are not?
c) Do you think your male colleagues feel similarly? Female colleagues?
d) When do backup electricity sources get turned on? What (do you believe) determines when they are turned on?
e) How are decisions about turning them on made? Who makes the decision?
f) Are you able to request that the backup source be turned on? If so, how do you make this request? Or can you in anyway influence the decision-making process? Are such requests ever rejected?
g) Do you believe some people have more say in when/how backup sources are used? If so, who?
h) Assuming the backup electricity source cannot be on at all times, what circumstances do you feel should determine when it should be turned on? Do you feel this is considered when determining whether to turn it on?
i) If backup electricity must be used sparingly, do you believe the treatment of certain patients should be prioritized? Certain departments? Or certain conditions/illnesses? Why these?
j) How do your personal priorities match with how the hospital has prioritized electricity?

6. Electricity outages – impact on work

a) How are your tasks and duties impacted when the electricity goes out? Are you able to continue doing your job? What changes must you make to your work/routine?
b) How about when a backup electricity source is running? *(Same questions as above)*
c) Do you anticipate/expect electricity outages while working? Do you ever take measures to prepare for them? What are examples of such measures?
d) How do you think anticipation of an electricity outage impacts how you perform your job? Do you ever decided against a treatment option or decided not to do a task because you are afraid the electricity will disappear in the process? Can you give some examples?
e) Are there any essential drugs, supplies, tests, or other resources that cannot be made available at this hospital because of an unreliable electricity supply?
f) What are some concrete ways the performance of this hospital could be improved if it had a more reliable electricity supply?
g) Do you see any solutions to the unreliable electricity supply at this hospital? Do you know of any hospitals or health facilities that are addressing these problems in a good way?
h) Do you think this hospital should be prioritizing similar solutions or are there other more pressing needs here? What are the more pressing needs/other important needs?

7. Motivation and emotional impact on hospital staff

a) Does your mood change when the power is out at work? If it changes, how?
b) Is your motivation to work effected by electricity outages? How?
c) Do you ever worry that the electricity will disappear while you are preforming critical duties? Can you give an example of such a situation? How often do you experience this worry?
d) Are you ever forced to find alternative solutions to solve problems when there is no electricity, for example to complete a required task or to meet a patient's needs? Can you give an example?
e) Are there ever circumstances when you have to inform a patient that treatment options are limited/unavailable because of a lack of electricity? How do patients receive this news? How do you experience this?
f) When there is an electricity outage, do you feel there is sufficient light on the compound, especially in the evening/at night? If not, how does this impact you?
g) How about when a backup electricity source is running? (*same questions as above*).
h) What do you believe is the main reason for an unreliable electricity supply at this hospital?
i) Is a lack of reliable electricity a problem you are hopeful will be addressed soon, or will this take a long time? Why do you think this?
j) Are you satisfied in your job, or are you looking to find another one soon? What is your ideal location and facility to work in? Why?
k) If you could improve one thing about your work conditions at this hospital, what would it be?

8. Impact of electricity on patients

a) In what ways do you witness outpatients being impacted by an unreliable electricity supply? How about inpatients?
b) What type of essential medical services are unavailable when the electricity is out? What about less essential ones? And other hospital support services?
c) What type of patients, in terms of illness/conditions, do you witness this effecting most?
d) Are there certain services more often needed by women or any more often needed by men that are unavailable when the electricity is out?
e) Are there certain services more often needed by infants, children, adults or the elderly that are unavailable when the electricity is out?
f) Do you ever receive complaints from patients about a lack of electricity? What about from their visitors? If so, how do you respond?

9. Administration and government relations

a) How does the hospital budget for grid electricity? Does this differ for the backup source(s)?
b) Does the government in anyway regulate electricity use in this hospital?
c) How are relations between the hospital and the Ethiopian Electric Power Corporation?
d) How is electricity incorporated/considered in government health strategies? What practical implications does this have for this hospital?
e) Are there any NGO's or intergovernmental organizations currently supporting this hospital? What are they supporting?